INDIAN SCIENCE CONGRESS
POONA, 1950
PART I

PROCEEDINGS

OF THE

THIRTY-SEVENTH

INDIAN SCIENCE CONGRESS

POONA, 1950.

PART I

OFFICIAL MATTERS

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Mr. D. Ganguli		
Dr. D. V. Bal		
Dr. H. D. Srivastava		

8. Anthropology and Archaeology—

Dr. C. Von Furer Haimendorf ..	*Convener*
Mr. Gautam Shankar Roy ..	*Recorder*
Dr. S. S. Sarkar	*Sectional Correspondent*
Prof. H. D. Sankalia	*Local Sectional Secretary*

Dr. S. K. Basu	*Elected Members*
(Miss) Hilda Raj	

Prof. P. C. Mahalanobis	
Dr. J. H. Hutton	
Dr. B. S. Guha	
Prof. K. P. Chattopadhyay ..	
Dr. G. S. Ghurye	
*Dr. D. N. Majumdar	*Past Presidents who are either Ordinary or Honorary Members*
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Dr. N. P. Chakravarti	
*Dr. (Mrs.) Irawati Karve ..	
Mr. A. Chatterjee	
Prof. Nirmal Kumar Bose ..	

Dr. G. M. Kurulkar	}	*Past Recorders who are either Ordinary or Honorary Members.*
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Dr. J. K. Bose		
Dr. N. Datta-Majumdar		
Dr. H. D. Sankalia		
Dr. P. C. Biswas		
Mr. M. N. Basu		

9. Medical and Veterinary Sciences—

Dr. M. V. Radhakrishna Rao ..	*Convener*
Dr. C. R. Das Gupta	*Recorder*
Dr. L. M. Ghosh	*Sectional Correspondent*
Dr. P. G. Gollerkeri	*Local Sectional Secretary*
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Dr. A. K. Bose	
Sir R. N. Chopra	*Past Presidents who are either Ordinary or Honorary Members*
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*Dr. A. C. Ukil	
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Prof. K. V. Krishnan	
Dr. S. W. Hardikar	
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*Prof. G. Panja	
Dr. M. B. Soparkar	
Capt. S. C. A. Datta	*Past Recorders who are either Ordinary or Honorary Members*
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Prof. G. Sankaran	
Mr. D. V. S. Reddy	
Dr. S. K. Basu	
Dr. Harendra Nath Ray	

10. Agricultural Sciences—

Mr. R. L. Sethi	*Convener*
Mr. L. C. Sikkha	*Recorder*
Mr. T. Ghosh	*Sectional Correspondent*
Mr. L. S. S. Kumar	*Local Sectional Secretary*
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Mr. K. Ramiah	
Rao Bahadur Y. Ramchandra Rao ..	
Dr. D. V. Bal	
Prof. N. V. Joshi	

Rao Bahadur Y. Ramanatha Ayyar ..		
Rai Bahadur Kalidas Sawhney ..		
Mr. N. L. Dutt		
Dr. R. S. Vasudeva		
Dr. S. V. Desai		
Dr. A. N. Puri		
Dr. C. N. Acharya		*Past Recorders who are either Ordinary or Honorary Members*
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Dr. B. L. Chona		
Dr. S. P. Ray Chaudhuri		
Mr. P. C. Raheja		

11. Physiology—

Dr. Kalidas Mitra		*Convener*
Dr. N. N. Das		*Recorder*
Dr. D. P. Sadhu		*Sectional Correspondent*
Dr. R. Vethavanam		*Local Sectional Secretary*
Dr. S. M. Banerjee		*Elected Members*
Dr. Sachchidananda Banerjee ..		
Prof. W. Burridge		
Lt. Col. S. L. Bhatia		
Sir R. N. Chopra		
*Prof. N. M. Basu		
Dr. B. B. Dikshit		
Rao Bahadur B. T. Krishnan ..		*Past Presidents who are either Ordinary or Honorary Members*
Prof. B. Narayana		
*Prof. S. N. Mathur		
*Dr. B. Mukerji		
Prof. P. De		
*Prof. S. A. Rahman		
*Dr. Bashir Ahmad		
Prof. B. B. Sarkar		
Dr. K. P. Basu		
Mr. B. Chatterji		
Prof. Khem Singh Grewal ..		
Mr. M. L. Chatterjee		*Past Recorders who are either Ordinary or Honorary Members*
Prof. G. K. Ghosh		
Mrs. Kamala Sawhney		
Prof. N. P. Benawari		

12. Psychology and Educational Sciences—

Prof. Kali Prasad		*Convener*
Mr. L. J. Bhatt		*Recorder*
Mr. S. C. Bisi		*Sectional Correspondent*
Mr. B. V. Bapat		*Local Sectional Secretary*
Mrs. Santa Deb		*Elected Members*
Mr. Samiran Banerjee		

Mr. N. S. N. Sastry	*Past Presidents who are either Ordinary or Honorary Members*
Dr. S. C. Mitra	
Mr. J. M. Sen	
Mr. K. C. Mukherji	
Prof. H. P. Maiti	
Dr. I. Latif	
*Dr. G. Pal	
Prof. B. L. Atreya	
*Dr. B. Kupuswamy	
*Dr. Indra Sen	
Dr. Zakir Hussain	
Mr. P. S. Naidu	
Prof. T. K. N. Menon	
Mr. S. K. Bose	*Past Recorders who are either Ordinary or Honorary Members*
Mr. Pars Ram	

13. Engineering and Metallurgy—

Dr. D. R. Malhotra	*Convener*
Mr. J. Dutt	*Recorder*
Mr. J. N. Basu	*Sectional Correspondent*
Prof. A. Desouza	*Local Sectional Secretary*
Mr. K. L. De	*Elected Members*
Dr. Himansu Kumar Mitra ..	
Mr. N. V. Modak	*Past Presidents who are either Ordinary or Honorary Members*
Sir Jehangir Ghandy	
Rai Bahadur A. N. Khosla ..	
Mr. P. H. Kutar	
Mr. H. P. Bhaumik	
*Mr. N. Sen	
Prof. M. Sen Gupta	
Prof. H. L. Roy	*Past Recorders who are either Ordinary or Honorary Members*
Dr. S. K. Sarkar	
Dr. J. Ganguly	

Sub-Committee on Science and its Social Relations:—

1-4. President, two General Secretaries and Treasurer (*ex-officio*).

5-17. Sectional Presidents of 13 Sections.

18. Dr. S. P. Agharkar (Poona).
19. Dr. K. N. Bagchi (Calcutta).
20. Prof. H. J. Bhabha (Bombay).
21. Dr. C. G. Pandit (Delhi).
22. Dr. Gilbert J. Fowler (Bangalore).
23. Dr. B. C. Guha (Calcutta).
24. Prof. D. D. Kanga (Madras).
25. Prof. H. P. Maiti (Patna).
26. Dr. H. K. Mitra (Jamshedpur).
27. Dr. K. Motwani (Adyar).
28. Prof. M. N. Saha (Calcutta).
29. Rai Bahadur K. D. Sawhney (Bom.)
30. Rai Bahadur J. M. Sen (Cal.) (*Convener*).
31. Sir S. S. Sokhey (Bombay).
32. Dr. A. C. Ukil (Calcutta).
33. Dr. D. N. Wadia (New Delhi).

4. LOCAL RECEPTION COMMITTEE

PATRON

His Excellency Raja Maharaj Singh, Governor of Bombay.

VICE PATRON

Lt. General Maharaj Shri Rajendrasinhji, D.S.O., G.O.C., in Chief. H. Q. Southern, Command, Poona.

CHAIRMAN

Rt. Hon'ble Dr. M. R. Jayakar, P.S., D.C.L., LL.D., Vice-Chancellor, University of Poona, Poona 3.

VICE-CHAIRMAN

D. V. Vyas, Esqr., I.C.S., Commissioner, Central Division, Poona 1.

LOCAL SECRETARIES

B. V. Bhide, Esqr., M.Sc., A.I.I.Sc., Sir Parashurambhan College, Poona 2.
S. V. Chandrasekhar Aiya, Esqr., M.A. (Cantab) B.Sc., A.M.I.E.E., Sen.M.I.R.E., 'Apka', Apte Road, Poona 4.

TREASURERS

Dr. V. N. Bhave, M.B.B.S., Near Peru-Gate, Sadashiv Peth, Poona 2.
Dr. D. D. Karve, M.Sc., Ph.D., Principal, Ferguson College, Poona 4.

MEMBERS

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Col. P. N. Bardhan, I.A.M.C.
S. G. Barve Esqr., I.C.S.,
S. Basu Esqr., M.Sc., F.N.I.,
Major E. Benjamin, D.P.H.
Col. S. K. Bose,
S. R. Chowdhuri Esqr., B.Sc. (Eng.).
M. M. Chaudasama, Esqr.
S. V. Dandekar Esqr. M.A.
Dr. B. M. Desai, M.S., F.C.P.S.,
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R. B. Gharpade, Esqr., B.Sc., (N.Y) M.L.A.,
Brig. F. J. R. Health, I.E.M.E.,
P. S. Hiray Esqr., B.A., LL.B.
Brig. R. E. Holloway.
V. K. Joag Esqr., M.A.,
V. G. Kanetkar, Esqr., B.Sc., I.P.,
Dr. G. S. Kasbekar.
S. L. Kirloskar Esqr.
S. K. Kulkarni Esqr.,
L. S. S. Kumar Esqr., M.Sc. (Lond.).
Dr. B. D. Laroia.
J. W. McBain Esqr., F.R.S.,

B. P. Patal, Esqr. I. C. S.,
D. C. Pavate, Esqr., M.A. (Cantab).
Brig. B. M. Rao, I.A.M.C.,
B. B. Sarkar, Esqr., M.Sc., M.I.E.E..
Major General, D. R. Thapar, C.I.E., O.B.E., M.D.,
B. N. Uppal, Esqr., Ph.D.,
M. R. Yardi, Esqr., I.C.S.,

5. ARRANGEMENTS FOR THE THIRTY-SEVENTH SESSION

The Local Reception Committee made all local arrangements necessary for the transaction of the scientific works of the session as well as for accomodation of the members and delegates who attended the session.

6. LIST OF DELEGATES

Great Britain		*America*
Sir. Robert Robinson, (N.L.).	..	Dr. E. U. Condon.
Lady Robinson.	..	Dr. Herman Mark.
Prof. J. D. Bernal.	..	Prof. A. H. Compton (N.L.).
Dr. Walter Zander.	..	Prof. Marshal Stone.
Dr. Harold Fisher.	..	Prof. S. Trone.

Sweden		*France*
Prof. O. E. H. Rydbeck.	..	Madam Irene Joliot Curie, N.L.
Prof. Herman Wold.	..	Prof. Fredric Joliot, N.L.
		Prof. P. Auger.
		Dr. & Mrs. Brumpt.

Canada		*Russia*
Dr. M. L. Miller.	..	Prof. D. Englehardt.
		Dr. Butrov.

Learned Societies.

All India Dental Association	.. ..	Dr. R. Ahmed.
		Dr. V. M. Desai.
		Dr. K. L. Shourie.
		Dr. M. K. Patel.
		Dr. N. N. Bery.
		Dr. S. K. Majumdar.
Calcutta Mathematical Society	.. ..	Prof. M. R. Siddiqi.
		Prof. F. W. Levi.
		Dr. N. G. Shabde.
		Dr. S. K. Chakraborty.
		Mr. S. Gupta.
Entomological Society of India	.. ..	Dr. K. S. Pruthi.
		Dr. S. Pradhan.
Indian Botanical Society	.. ..	Prof. G. P. Majumdar.
		Prin. Y. Bharadwaja.
		Dr. T. S. Mahabale.

Indian Research Fund Association ..	..	Dr. C. G. Pandit.
The Institute of Engineers (India)	..	Shri A. N. Khosla. Shri J. Dutt. Dr. D. R. Malhotra. Shri K. B. Ray. Shri J. Ganguly. Shri R. Sahaya. Shri H. S. Batliwala. Shri M. L. Champehkar. Shri K. T. Divecha. Shri S. B. Joshi. Rao Bahadur N. S. Joshi. Khan Bahadur Framroz D. Mehta.
National Institute of Science of India, Delhi.		Prof. S. N. Bose.
National Nutrition Association of India	..	Prof. V. Subrahmanyan. Prof. G. Sankarar.
Royal Asiatic Society of Bengal ..	..	Dr. A. C. Ukil. Dr. K. N. Bagchi. Dr. K. Biswas. Dr. S. K. Mitra. Dr. J. L. Bhaduri. Dr. Meghnad Saha. Prof. J. M. Sen.

Universities.

Aligarh Muslim University—Aligarh	..	Mr. Shamim Ahmed. Dr. N. M. Basu. Mr. Omar Ali Siddiqi. Dr. M. A. H. Qadri. Dr. M. A. Basir Khan. Mr. Jamil Ahmed Siddiqi.
Andhra University—Waltair ..	..	Prof. C. Mahadevan. Mr. C. Venkata Rao.
Baroda University—Baroda ..	..	Dr. C. S. Patel. Dr. D. V. Gogte. Mr. L. J. Bhatt.
Banares Hindu University—Banares	..	The Pro. Vice-Chancellor, B. H. U. The Principal, College of Science. The Principal, College of Technology The Principal, College of Agriculture. The Principal, College of Mining and Metallurgy. The Principal, Engineering College. The Principal, Central Hindu College.
Calcutta University—Calcutta ..	..	Prof. S. N. Bose. Mr. S. K. Bose. Dr. D. Chakravarty. Prof. P. C. Sarbadhikari. Dr. P. K. Bose. Mr. N. K. Nande. Mr. Gautam Sarkar Ray.

	Dr. S. P. Ray Choudhury.
	Dr. B. C. Halder.
	Prof. J. M. Sen.
	Dr. B. B. Sarkar.
Nagpur University—Nagpur	Dr. M. A. Moghe.
	Shri K. Sripada Rao.
	Dr. A. N. Kappanna.
	Dr. V. B. Shukla.
	Dr. M. C. Nath.
	Shri S. Mookerji.
Osmania University— Hyderabad, Dn., ..	Dr. J. C. Kameswar Rao.
	Dr. Syed Husain Zahir.
	Dr. Syed Husain.
	Dr. B. K. Das.
Madras University—Madras	Dr. M. A. Govinda Rao.
	Dr. C. P. Gnanamuthu.
	Dr. S. P. Sarma.
	Dr. U. R. Erhenfels.
	Dr. T. S. Sadasivan.
	Shri D. V. Rajalakshman.
Rajputana University—Jaipur	Dr. Dayal Krishna.
Travancore University—Trivandrum ..	Dr. C. S. Venkateswaran. ..
	Dr. K. Bhaskaran Nair. ..
	Dr. A. Abraham.
	Dr. S. S. Pillai.
	Shri A. Venkitachalam Aiyar.
	Shri R. Ramachandra Aiyar.
	Shri E. I. George.
	Shri. M. C. Abraham.
	Miss Aleyamma George.
	Miss Mary John.
	Shri N. Krishna Pillai.

RESEARCH INSTITUTIONS AND COLLEGES

Ferguson College—Poona	Prof. R. V. Barve.
	Prof. K. V. Kelkar.
	Prof. V. V. Apte.
	Prof. G. L. Chandratreya.
	Prof. B. G. Shirole.
	Prof. D. D. Vadekar.
	Dr. K. K. Dole.
Forest Research Institute and College, —Dehra Dun	Dr. D. Narayanamurti.
Gaya College—Gaya	Mr. N. C. Agarwala.
Geological Survey of India—Calcutta ..	Dr. W. D. West.
	Dr. J. B. Auden.
	Dr. A. K. Dey.
The National Academy of Science, Allahabad	Prof. H. R. Mehra.
	Prof. D. R. Bhattacharya.

Prof. Shri Ranjan.
Prof. N. R. Dhar.
Prof. A. C. Banerji.
Dr. P. L. Shrivastava.
Prof. Ram Behari.
Dr. Ram Kumar Saksena.

Zoological Survey of India, Calcutta .. Dr. S. L. Hora.
Dr. B. S. Chauhan.
Dr. A. P. Kapur.

GOVERNMENT OF INDIA, PROVINCIAL GOVERNMENTS AND STATES

Ministry of Defence, Govt. of India, New Delhi Major General P. N. Thapar.
Major General H. Williams.
Major General A. N. Sharma.
Brigadier H. G. Parcell.
Dr. R. S. Thakur.
Col. N. N. Chopra.
Lt. Col. P. L. Kapur.
Lt. Col. B. N. Mitra.
Dr. T. S. Subramaniam.
Col. C. C. Kapila.
Lt. Col. O. P. Varma.
Lt. Col. J. L. Duff.
Mr. C. V. S. Sastry.
Mr. G. De.
Brigadier R. E. Holloway.
Col. A. Campbell Harris.
Mr. B. B. Chaudhury.
Major General D. R. Thapar.
Mr. K. K. Framji.
Mr. C. C. M. Broughton.
Mr. J. G. Keswani.
Mr. S. J. Shahaney.
Capt. W. J. Saxton.
Captain Daya Shanker.
Captain Superintendent H. M. I. Dockyard, Bombay.
Group Captain D. N. Chakravarti.
Group Captain Atma Ram.
Dr. D. S. Kothari.
Dr. Sohan Lal.
Dr. R. S. Varma.
Dr. N. B. Bhatt.
Dr. Haripada Nath.
Dr. Sampooran Singh.

Ministry of Education, Govt. of India, New Delhi .. .. Mr. G. K. Chandiramani.
Dr. P. D. Shukla.

Dept. of Scientific Research, Govt. of India, New Delhi.	Dr. S. S. Bhatnagar. Mr. T. Gansalves.
Dept. of Anthropology, Govt. of India ..	Dr. A. K. Mitra.
Director General of Health Services, New Delhi.	Dr. B. Mukerji.
Ministry of Agriculture, Govt. of India, New Delhi	Mr. Mohan Singh. Mr. D. R. Bhatia. Dr. J. C. Saha. Dr. H. S. Pruthi. Mr. J. S. Sarma.
Ministry of Industries and Supply, Govt. of India, New Delhi.	Dr. J. C. Ghosh. Dr. J. N. Ray.
Govt. of Assam	Shri P. C. Chowdhury.
Govt. of United Provinces, Dept. of Economics & Statistics	Shri J. K. Pande.
Govt. of Orissa, Dept. of Development, Cuttack	Shri P. B. Brahma.

COMMERCIAL BODIES

Bengal Nagpur Railways	Shri S. A. Yusoof. Shri Sudarshanlal.
Federal Public Service Commission, New Delhi	Mr. G. C. Chatterjee.

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7. PROGRAMME OF THE SESSION

The Thirty-Seventh Session of the Indian Science Congress was held at Poona under the auspices of the Poona University from January 2 to 8, 1950.

The inaugural meeting was held on Monday, January 2, 1950 in a Pandal erected for the purpose in the Fergusson College grounds, Poona, in the presence of a large number of delegates, members and visitors. The presence of foreign Scientists from Great Britain, Canada, America, Sweden, Frances and Russia was a special feature of this session of the Congress.

Dr. M. R. Jayaker Vice-Chancellor, University of Poona, as chairman of the Local Reception Committee welcomed the delegates and members and requested Hon'ble Dr. Shyama Prasad Mookerjee Minister-in-charge of Industries & Supplies, Govt. of India to open the Congress. Hon'ble Dr. Mookerjee delivering a short speech declared the proceedings open. After the speech of Hon'ble Dr. Mookerjee, the President, Prof. P. C. Mahalanobis delivered his address. After the Presidential address, Prof. P. C. Mahalanobis, requested Hon'ble Pandit Jawharlal Nehru, Prime Minister, Govt. of India, to say something before the vast gathering. The Hon'ble Pandit Jawharlal Nehru then addressed the members and guests of the Indian Science Congress. The meeting terminated with a vote of thanks to Nehru, Hon'ble Dr. Shyama Prasad Mookerjee and other distinguished visitors and patrons proposed by Dr. B. Sanjiva Rao, one of the General Secretaries.

Sectional meetings were held in the Ferguson College Premises. The following is a summary of the week's Programme.

SECTIONAL PRESIDENTIAL ADDRESSES

The Presidential Addresses of the Sections were delivered as follows:—

Tuesday, 3rd January 1950, 3 P.M., Anthropology & Archaeology; 3-30 P.M., Agricultural Sciences.

Wednesday, January 4th, 9-30 A.M., Engineering and Metallurgy; 10 A.M., Mathematics; 10-30 A.M., Geology & Geography.

Thursday, January 5th, 9-30 A.M., Physiology, 10 A.M. Physics.

Friday, January 6th, 9-30 A.M., Statistics; 10 A.M., Chemistry; 10-30, Medical and Veterinary Sciences.

Saturday, January 7th, 9-30, A.M., Botany; 10 A.M., Psychology and Educational Sciences; 10-30, A.M. Zoology & Entomology.

SPECIAL ADDRESSES

Several Special Addresses were as follows:—

Tuesday, January 3rd, 12-15 1-0 P.M. (*a*) Madam Curie Joliot, Sub:—'Radioactivity artificielle,' (*b*) Sir Robert Robinson, Sub:—Recent Developments in the Chemistry of the Alkaloids.

Wednesday January 4th, 12 noon to 12-50 P.M. Prof. Desmond Bernal, Sub:—"The Structure of Proteins, viruses, sterols and other bio-chemical active substances". Prof. Joliot Curie, Sub:—"L'evolution de la Physique Nucleare".

Thursday, January 5th, 12 noon to 12-50 P.M., (*a*) Prof. Herman Mark, Sub:—"Thermo-Dynanmics of Polymer Solutions" (*b*) O. E. H. Rydbeck, Sub:—"Interaction of Ionosphere and Radio-waves."

SYMPOSIA AND JOINT DISCUSSIONS WERE HELD AS FOLLOWS:

Monday, January 2nd. 1950.

	Subjects	
1.	Operational Research in peace and War	.. *Under the auspices of the National Institute of Sciences of India.*

Tuesday, January 3rd 1950.

		Sections
1.	"Electric Alloys and their Deposition"	.. *Chemistry.*
2.	Teaching and Examinations in Botany	.. *Botany.*
3.	Place of Entomology in the Teaching of Zoology in Indian Universities	.. *Zoology & Entomology.*
4.	Film show on "Operation Shock" by I.C.I.	.. *Medical & Veterinary Science & Physiology.*
5.	Medical Evaluation of Nutritional Status	.. *Medical & Veterinary Science & Physiology.*
6.	Food Production and River Valley Projects	.. *Engineering & Metallurgy.*

7.	Symposium on "Cosmic Rays"	.. *Physics.*
8.	Syllabi in Mathematics in Indian Universities and Public Service Examinations	.. *Mathematics.*
9.	Report on Statistical Inference	.. *Statistics.*
10.	Problem of Indian Tribes	.. *Anthropology & Archaeology and Psychology & Educational Sciences.*
11.	Symposium on Engineering Developments in India in Relation to the Social Welfare	*General Symposium under the auspices of the Sub-Committee on Science and its Social Relations.*

Wednesday, the 4th *January* 1950.

1.	Teaching Statistics	.. *Statistics.*
2.	Structure of Molecules	.. *Chemistry.*
3.	Factors involved in the Production of Fish Population,	.. *Zoology & Entomology.*
4.	Future of Psycho-analysis as Therapy and Theory,	.. *Medical & Veterinary Sciences and Psychology & Educational Sciences.*
5.	Economy in Steel Construction,	.. *Engineering & Metallurgy.*
6.	"Rice",	.. *Agricultural Sciences & Physiology in Colaboration with the National Nutrition Association of India.*
7.	Riemannian and Non-Riemannian Geometrics,	.. *Mathematics.*
8.	Liquid State,	.. *Physics.*
9.	Tenth All India Pharmaceutical Conference, Symposium.	

Thursday, 5th *January* 1950.

1.	Planning of "Grow More Food" Measures and Assessment of Results,	.. *Statistics & Agricultural Sciences.*
2.	"Anti-Malarials"	.. *Chemistry.*
3.	Application of Genetics in Animal and Plant Breeding,	.. *Zoology & Entomology and Botany.*
4.	Nutritional Macrocytic Anaemias	.. *Medical & Veterinary Sciences.*
5.	Metal Testing and its Limitations in India	.. *Psychology & Educational Sciences.*
6.	Place of Objective Tests in University Education,	.. *Psychology & Educational Sciences.*

7. "Coal Conservation" .. *Engineering & Metallurgy.*

Friday, 6th *January* 1950.

1. Symposium on 'Cloud Particles' .. *Physics.*

2. The Measurement of Economic Demand, .. *Statistics.*

3. "Degradation of Cellulose" .. *Chemistry.*

4. Industrial Housing .. *Engineering & Metallurgy.*

Saturday, 7th January 1950.

1. Medical Education in India in relation to Psychiatry and Psychology .. *Psychology and Educational Sciences and Medical and Veterinary Sciences.*

3. Film show on "Control of Infection in Surgical Dressing and Humoral Transmission of the Sympathetic Impulses by I.C.I.

MEETING OF THE COMMIITTEES

General Committee met on January 2nd, at 3 P.M., and again on January 5th 2-30 P.M.

Sectional Committee met on 2nd January at 9 A.M. and 3rd at 10 to 12 noon, and 3 to 4-30 P.M. and on 4th January at 9 A.M. to 12 moon, and on 5th January at 9 A.M. to 12 noon, and again on 7th January at 9 A.M. to 12 noon.

Council met on January 1st at 5 P.M. and again on 4th January at 3-45 P.M.
Executive Committee met on January 1st, at 4 P.M. and on January 4th at 2-30 P.M.
Sub-Committee on Science and its Social Relations met on January 4th at 2 P.M.

SOCIAL FUNCTIONS

January 2. Film show by the tenth All India Pharmaceutical Conference (by invitation).

January 3. (1) Opening ceremony of the National Chemical Laboratory by the Hon'ble Jawaharlal Nehru.

January 4. (1) Jubilee Session of the Indian Psychological Association.
(2) Tea by Mr. M. L. Dahanukar at the University Gardens.

January 5. (1) Tea by the Local Receiption Committee at the University Garden.
(2) Talkie Film on Atomic Physics with Commentary by W. D. West,

January 6. (1) Film Show on Sindri Fertilizer,
(2) Agricultural Exhibition at the College of Agriculture.
(3) Tea by Mr. G. R. Sathe at Danavri Village.
(4) Variety Entertainments.

January 7. Film Show on Physiology of the Kidney, by I.C.I.

POPULAR LECTURERS

January 2. "Recent Progress in the Chemistry", by H. Mark.
"History of Science" by J. D. Bernal.
January 3. "First Release of Atomic Energy" by A. H. Compton.
"Penicillin Research" by R. Robinson.
January 4. The Role of Mathematics in Physical Thought by H. J. Bhabha.
Popular lecturer VI.
January 5. Popular lecturer VII (Shamiana).
Popular lecturer VIII (Shamiana).
January 6. Popular lecturer IX.
Popular lecturer X.
January 7. (1) Utilisation of Scientists on Railways by D. R. Malhotra.
(2) Popular lecturer XII.

LOCAL EXCURSIONS

Armed Forces Medical College.
Hydrodynamic Research Station, Khadakwasla.
School of Military Engineering, Kirkee.
Bhatnagar Dam and Associated Chemical Laboratories Bhor Industries, at Bhatnagar.
Maharasriya Mandal, Physical Exercise demonstration at Tilak Road, Poona 2.
Tea at Deccan Studio by Mr. G. L. Jobanputra.

WHOLE-DAY EXCURSION

(1) Ogalewadi and Kirleskarwadi.
(2) Khopoli and Karla Caves.
(3) Khadakwasla and Sinhagad Fort.
(4) Mahabaleswar and Panchagani.

ANNUAL MEETINGS OF LEARNED SOCIETIES

January 1:

(1) Indian Psychiatric Society.
(2) Indian Association for the Cultivation of Practical Sciences, and Industrial Operations.
(3) Indian Botanical Society.
(4) Indian Pharmaecutical Association.
(5) Indian Society of Geneties and Plant Breeding.
(6) Helminthological Society of India.

National Institute of Science (Council Meeting).
National Institute of Science (Committee Meeting).

January 2:

(7) All India Pharmaceutical Association.
(8) National Institute of Science of India.
(9) Entomological Society of India.
(10) Indian Chemical Society.
(11) Indian Physical Society.
(12) Society of Biochemical Chemistry of India.
(13) Zoological Society of India.

Royal Institute of Chemistry (Members Meeting)

January 4:

(14) Indian Association for Advancement of Science.

January 5:

(15) Institute of Chemists (India)
(16) Association of Scientific Workers of India.

8. OPENING PROCEEDINGS

Rt. Hon'ble Dr. M. R. Jayakar, Vice-Chancellor of University of Poona and Chairman of Local Reception Committee welcomed the members and delegates with the following Speech.

Welcome Speech:

Your Excellency, Pandit Jawharlal Nehru,
Ladies & Gentlemen,

It is my proud privilege this afternoon to tender you all a cordial welcome on behalf of this young University. I call the University young, but it may be noted that it is planted in and caters for the requirements of a city which is very ancient in its educational, cultural and political attainments. Poona was made a capital town of the Marhatta territory more than 200 years ago, and since then it has held its position even under British rule. In the days of the Maratha rulers it used to be the centre, not only of political power, but also of culture and learning. Some historians record that the Maratha rulers used to hold every year conferences of learned men gathered from all over India and distribute as rewards for learning amounts which often ran to 18 lakhs, equal to £140,000 a year. This session of the Indian Science Congress, therefore, can be said to be carrying on the traditions of these learned conferences, and I hope the results will be equally fruitful.

This is a great day in the annals of this young University. The University feels very grateful that, inspite of its infancy, you should have responded to its call to assemble here this time. It is a great gathering of unique value. Present in our midst are most distinguished persons from different parts of the world, amongst whom figure prominently Sir Robert Robinson, F.R.S., Dr. A. H. Compton of great reputation in the development of atomic energy, Madame Joliot-Curie of great fame, Professor Frederic Joliot, Professor Bernal and many others of great eminence in the scientific world. Likewise, there are present on this occasion men distinguished in the present administration of the country, Pandit Jawharlal Nehru, the Prime Minister of India, whose love for scientific achievements are well known, and I beg to associate myself with comments which the Bombay Premier has made in that connection. There are, besides, Dr. Shyama Prasad Mookerjee, a member of the present Cabinet of the Government of India, an intimate friend with whom I had the pleasure of working on another platform for many years, and Professor Mahalanobis, whose reputation as a statistician has preceded his visit to this city. We feel it a great honour to welcome them. The Premier of Bombay has very kindly made it convenient to be present and speak on this occasion, for which we are very grateful. Over all this assembly the popular Governor of Bombay, His Excellency Raja Sir Maharaj Singh, presides, and we thank him for sparing the necessary time.

This University expects a great many things from this session of the Science Congress, therefore, can be said to be carrying on the traditions of Science Congress. To begin with, the young men of this University will have the pleasure of seeing in flesh and blood the great scientists who up to now have been mere names to them. I may mention that it is a tradition of Indian learning that contact should be established between the greatest men of the age and the young men who are aspirants after knowledge. In one of the books regarded as a holy scripture of India, it is recorded that, after a great seer had delivered an oration upon the merits of philosophy and learning, he was asked: "Can we see a great man, how he lives, how he walks, how he talks?" It appears to be a most natural desire of the young mind to see the great men of its age. That itself is a great education stirring them up to emulation. The sight therefore at this session of so many distinguished men will, I am sure, have very great effect upon the young men of this University.

We also hope that the papers that will be read and the lectures that will be delivered in your sectional meetings will throw light on many problems which are confronting educationists not only in India, but elsewhere in the world. This University has its problems also, and I devoutly hope that your discussions and your papers will throw light upon some of the main problems agitating the world, viz. how to bring scientific achievements into relation with the social requirements of the community. Science so far has achieved many things, but unfortunately its discoveries and inventions have been utilized, not for promoting social welfare but for purposes connected with the destruction of human life. Gradually a consciousness is growing that this must be stopped, and let us hope that your discussions at the sectional meetings will awaken the Professors and the students of this University to do their bit in diverting science towards the well-being of their generation.

Lastly come your popular lectures which the Indian Science Congress makes it a practice to deliver at every session. Our students are looking forward to great benefit by listening to these lectures, which will all be delivered by experts in their own departments. If this has the effect of awakening in the minds of our students the desire to learn more and more of science, the purpose of calling the session here will be partially achieved. Our students are yearning to see these distinguished men and listen to the words of instruction and advice which will fall from their lips or flow from their pen.

This University shares the general feeling in the country that the keynote of Indian progress is at present scientific advance. This sense is growing all over the country, because it is felt that the best way of achieving our present ideal, viz., to bring knowledge to the doors of the ordinary man, and to base his life on progressive advance, can only be achieved by the spread of scientific knowledge. There is great emphasis, therefore, laid

to-day upon scientific instruction. The popular aspect of it forms one of the ideals and the aims of this University, for by the Act of its Incorporation the obligation has been laid on this University to spread knowledge all over the countryside and to bring it within the reach of those who cannot come to this University and profit by its corporate life or the instruction afforded here. This University, therefore, has already started on that mission, and it has held up to now several popular lectures delivered by experts for the benefit of the general public. It has also considered, through the report of a Special Committee, how the aspirations after academical instruction of those who, owing to employment elsewhere during the day or any other cause like insufficiency of resources, are unable to be present at the Colleges during the day, can be fulfilled. One such means has been suggested, viz., the creation of an external degree, the details of which are being worked out, and when complete, they will have the effect of drawing into the circle of University instruction all those who are unable to take advantage of the regular classes held here during the day. In support of this aspect of the University's activities, your popular lectures will be of very great value. It is realized that scientific advance cannot be achieved in isolation. India therefore desires to participate more and more intensively in the pool of international advance, making her own contribution from time to time. She realizes further that there must be an exchange of thought and effort with other countries of the world if she is to advance on proper lines. This University shares this view and hopes that the achievement of this ideal will be greatly helped by the session of the Indian Science Congress which is now being held here.

I welcome you all here on behalf of this University. We have planned a programme which, I hope, will enable you, in addition to your work, of delivering lectures or reading papers, to see Poona and its environments some of which are of great historical value. As I have stated before, Poona is an ancient city with many places of historical interest round about, created by Nature or by the industry of man. It will be a great pleasure for us to take you round to some of these places, and an intensive programme of excursions has been planned, of which I hope you will take full benefit.

This is our first effort to welcome and entertain a large and distinguished body like the Science Congress. It is not unlikely that you will come across some deficiencies. If so, may I hope that you will kindly overlook them?

After the Welcome address, Rt. Hon'ble M. R. Jayakar requested Hon'ble Dr. Syama Prasad Mookerjee, Minister-in-charge of Industries and Supplies Govt. of India to inaugurate the Thirty-seventh Session of the Indian Science Congress.

Hon'ble Dr. Mookerjee in declaring the Congress open delivered the following address:—

Mr. President & Fellow seekers of truth.

I deem it a privilege to have been invited to inaugurate the Annual Session of the Indian Science Congress. I accord a cordial welcome to all

who are assembled here today, specially to the band of distinguished delegates who have come from abroad to participate in the deliberations of the Congress. During the last 37 years, the Indian Science Congress has grown from strength to strength and its great representative character today is an unmistakable evidence of the progress which India has achieved in the domain of science during the last half a century. A close association of distinguished foreign delegates with the Congress reveals the bond of unity that prevails in the field of science which knows no boundaries or geographical limits.

The historic city of Poona in and around which vibrate the memories of some of the proudest and the most valiant achievements of our ancestors is also a home of great cultural endeavours. It provides an appropriate setting for the Congress and will inspire all who are assembled here to face their responsibilities with courage and confidence.

The Annual Session of the Indian Science Congress serves as a yearly reminder to our scientists of the need for continuous dedication of scientific knowledge to the service of our motherland and of humanity at large. Such self-introspection is particularly necessary at this juncture of world history when the menace of atomic warfare hangs like a darkening cloud on the minds of all thinking men and women. An unanswered question is written across the future: Is man to be the master of the civilization he has created, or is he to be its victim? Can he control the forces which he has himself let loose? The only answer to it and the only way to counteract the threat is by a spiritual upsurge in the minds of common men and women in every country such as will compel the application of scientific knowledge towards the good of the world. Science, like religion, cannot be had in itself. It is the purpose and the social function which such knowledge serves that makes it good or bad. This view is not new to India. Indeed, this is the only view that has found favour with our sages and savants from ancient times. Our scientists are the inheritors of this age-old tradition and I have no doubt that they will never be a party to the utilisation of science for ignoble ends.

In speaking of the services of science it is usual in our country to dilate on the actual and potential contribution of scientific knowledge to the development of our agriculture and industry, and of our arts and crafts in war and peace. But I venture to think that the greatest contribution that science can make to the well-being of our country is by the inculcation of that attitude of mind, which for lack of a more expressive phrase is known as the scientific attitude towards life and its problems. The essence of this attitude lies in an inquisitive mind, not by any means of that of a narrow specialist, but of one that would ask questions and would not rest till it has found an answer to them. It shows itself in a diligent and an indefatigable search for facts, and when facts have been ascertained, in an objective study of their inter-relations. Valuation of facts thus determined and appraised

is a subsequent process and must depend on one's individual moral judgment. An effective exercise of this judgment, however, becomes impossible unless the essential precondition of ascertaining facts and weighing them as objectively as possible has been fulfilled.

Nothing in this country impedes the application of scientific knowledge to the betterment of human beings or to the promotion of our agriculture and industry more than lack of this frame of mind. The great majority of our countrymen are still victims of ignorance and prejudice and are moved more often by set habits than by an objective analysis of the pros and cons of a particular course of action. As all scientists, social workers and administrators know, it is this conventional and passive attitude that offers the greatest resistance to the adoption of new habits and ways of living, new methods and practices in agriculture and new techniques and equipments in our unorganised industries which still constitute the major field of employment to our artisans and workers.

The gap between our scientific knowledge and its application to some of our current problems is as much a consequence as it is a cause of this lack of scientific attitude. To illustrate this argument I would deal separately with the application of scientific knowledge to our problems of public health and hygiene, agriculture and industry.

The laws of public health and hygiene are now so well-known and well established that it is a surprise to many observers not familiar with Indian conditions that they are so often honoured in their breach rather than in their observance not only in the countryside but also in urban areas. The problem is not merely one of organisation, equipment and finance but also of the creation of that inclination which alone can absorb the teachings of these laws and make them part of one's nature. It is not merely illiteracy, stupendous as that handicap is, that bars the door to most of our health reform; what blocks it effectively is the habit of mind born of centuries of suffering and inertia.

This applies to agriculture as well. It has been recognised during the last sixty or seventy years that one of the major problems of agricultural reform in this country is the extension of scientific knowledge from the laboratory to the field. Although some progress has been made in one or two particular lines, this basic problem of extension of scientific knowledge still remains unsolved.

The same mental attitude is a precondition for the effective application of the knowledge of science and technology to the problems of modern industry. Here, of course, the character of the problem somewhat changes; for by its very nature competitive industry can function in the long run only against the background of world development and no industrialist, however conservative, parochial or wedded to time-worn methods, can altogether ignore the results of science and technology. In this context science has therefore a much better chance to function but there are other

problems connected with the application of science to industry which have to be tackled. One of them is the problem of co-ordination of scientific research as carried out in different institutions and the allocation of responsibility to them. There are four broad types of scientific institutes in our country, viz., Universities and other academic bodies; institutions of applied science; purely technological institutes, and lastly institutions supported by private industry. Is it possible to agree upon an appropriate allocation of research work to these institutes so that overlapping and duplication of efforts resulting in an unbalanced, lopsided development of scientific research in its different aspects may be avoided? In a vast country such as ours some duplication is unavoidable. Still, the need for a rational distribution of work among our scientific institutions is urgent specially in view of our limited resources in men, money and equipment. A body like the Indian Science Congress, embracing as it does all branches of science, can effectively deal with these issues of organisational policy, which in my judgment will not only influence the advancement of scientific knowledge in this country but also its effective application to problems of welfare.

Another question relates to the responsibility that naturally devolves on the present generation of our scientists to train up our young graduates of science, who may choose a scientific career for the high task that awaits them in future. One of the most outstanding achievements of the last half a century has been the tempo of scientific advance in this country and the quality of our scientific research inspite of many handicaps. We have built up a body of scientific men and women of which any country can be proud. Can our senior scientists assembled in this gathering assure us that this fine record will be maintained and even further strengthened in future? I am not unaware of the many handicaps and difficulties from which scientific institutions and research workers have suffered in the past. But inspite of all this, have our scientists done all in their individual capacity as teachers, directors or research officers, to supervise, help or encourage the junior investigators placed in their charge? Have they given of their best to their wards in the same way as they received the best from their masters in an earlier generation? I venture to pose this question before a representative forum like yours in the hope that the problem will receive your earnest consideration. If as a result of our deliberation you feel that scientific talent in this country is not receiving its due share of encouragement and support, or that the standard of work should be raised or that we are not guarding against the dangers of over-specialisation, it will be for you to contrive such measures as you consider necessary to remedy this state of affairs. Nothing would cause so lasting a damage to the prospects of scientific progress as the drying up of the springs of creative talent for want of encouragement or proper guidance.

India today stands at the cross-roads of history. She has attained her political independence after nearly two centuries of foreign rule. The problem of national reconstruction is perhaps more arduous and gigantic

than the struggle for freedom itself. Millions of India's population are waiting to be served and uplifted in terms of that equality of opportunity which, under the Constitution of the Republic of India, is their inherent and inalienable right. It is through science and science alone that the full achievement of this goal will be rendered possible. The opportunities for national service which thus await the present generation of Indian scientists cannot be over-emphasised. They can therefore legitimately claim from the State unstinted support for carrying on their progressive activities. This support, whether coming from the State or from private sources, must not in any way curb the independence of their profession or render them subservient to the ideologies of any party or faction. Nothing is more important or sacred both from the point of view of their own work and from that of national advancement that our Universities and Research Institutions should be allowed to grow in an atmosphere of freedom. We are fortunate in having amidst us today Pandit Jawaharlal Nehru not only because he is our Prime Minister but also because of his unflinching faith and interest in the cause of progress of science in India. Let me fervently wish that during the difficult period of transition through which our country is passing, our scientific workers throughout the land may uphold the highest traditions of scientific pursuit and so consolidate and co-ordinate their activities as to be able to contribute their due share in the great task of national reconstruction. I wish every success to your deliberations, under the leadership of your distinguished President, Prof. Mahalanobis.

After the inaugural speech of Dr. Syama Prasad Mookerjee, Pandit Jawaralal Nehru was requested to say something by the President.

Prime Minister, Hon'ble Pandit Jawharlal Nehru, while addressing the Conference paid tributes to the visiting scientists and said:—

Ladies & Gentleman,

"These eminent men and women should not confine themselves to the deliberations of the Conference alone but should talk to our youth and make them feel the international quality of science. Men and Women of Science must inculcate a spirit of international outlook in the minds of India's youth, who would have to bear the burden of future administration of India.

"In the olden days the men of knowledge had had to go to those in power for their maintenance. Their works had to be dedicated to those who dominated that age. But now the scientist stood on the same footing as the politician. The scientists having become fairly important, the politician, whether he knew anything about science or not now praised science all the time.

"Whether we understand science or not we are now certainly very much conscious of the fact that modern world is dominated by science. To-day we want the scientist to help us in our jobs. But we do not like his suggestions and even begin to think he is interfering too much in other people's

way of doing things. The politician neither follows the advice given to him by the scientist nor follows his own way. It is obvious that in india and many other countries round, about this is what is happening.

"We have certain primary problems of great importance. Many other countries, whatever may be their social and economic problems are having fairly high standards of living. In these countries, where the necessities of life are provided to a great measure, the primary problems do not assume as great an importance as in our country. The people and the Governments of those countries can think of peace and war, prepare for war and talk of peace as the case may be. In fact, in some places the two things go together.

"In an underdeveloped country like India primary needs were such that they could not talk in any other terms except financial stringency and balancing the economy. Situated as we are, our basic desire is not to get entangled in the tangled web of power politics. Friction caused by power politics will lead to war. Everything we desire and work for in India requires peace and a calm atmosphere to strive for the development of the country so that we may fulfil those primary needs of the people.

"There is no doubt that in India there is a growing realization of this fact that the politician and the scientist should work in close co-operation. The solution of all our social and economic problems depends on this Co-operation and no state can afford to ignore this fact.

"We got power, and it was followed by difficulties and problems of extreme urgency. Whether we have faced these difficulties adequately or not, we were compelled to put aside vague conceptions and proceed with the urgent need of the hour. To-day unexpected pressure has been brought to bear upon us in economic and other spheres with the result that we have to think entirely in terms of rigid economy. All these difficulties came when we had thought of a vast number of schemes to raise standards in India. In many ways we in India are at a very low level. We have to solve our problems and overcome our difficulties. For this we want the assistance of scientists in as practical a way as urgent a way as possible.

"In India, we were dominated by a lawyer's mentality and more lately by a classical philosopher's. Latest, in the picture was the business man's mentality. The lawyer still played a fairly important part in Indian politics. But neither the lawyer nor the classical philosophers can solve our problems. Present problems of India are to be tackled not with the approch of a lawyer or a classical philosopher but with a partly scientific and partly engineering approach. I doubt very much if a business man with his limited outlook can play any part at all. Our problems are to be tackled not with the spirit of a man who does things himself and does not sit in the office ordering people about.

"I appeal to you not to think too much of science metaphysics or hypothetical theories but to become objective realists. I also appeal to

young men and women of India to give up their nationalist sentiments now that we are free from colonial rule and are a sovereign nation and channelize your energies into constructive spheres. But if we still continue to show our nationalist sentiment then our country or for that matter any other nation, cannot aspire to a great future or an honoured place in the comity of nations."

9. ANNUAL REPORT OF THE INDIAN SCIENCE CONGRESS ASSOCIATION 1949

Introduction

During the year under report, the activities of the Indian Science Congress Association have been maintained at a satisfactory level inspite of depletion of staff and shortage of office accomodation. Several Members and office Bearers of the Association were invited by the Government of India to work in a number of Expert Committees to give advice to Government in various developmental schemes and projects. Two important delegations—one to the Natural Resources Conference at New York and another to Australia—were sent by the Government of India and in both these delegations, Members of the Indian Science Congress Association played very prominent parts, bringing Indian Science to the notice of the world. As in previous years, the Association received recognition from many foreign Scientific Bodies. A large number of enquiries were received from Scientific Associations in Australia, America, Canada, Great Britain, Russia, etc. and also from such countries as Ceyion, Afganistan, Indo-China and Israel. Because of lack of funds, the Association could not honour the invitations by sending special delegates but had to remain content by sending messages of good will, so that reciprocity could be adequately maintained. It is hoped that with the betterment of the financial position of the Association, more contacts could be maintained and mutual relationship with the Scientists and Scientific organizations in these countries developed. It is a welcome sign that the work of the Indian Science Congress Association is being increasingly recognised beyond the borders of India.

Thirty-sixth Session: The 36th Session of the Indian Science Congress was held at Allahabad from 2nd to 8th January, 1949 under the auspices of the University of Allahabad and was presided over by Sir K. S. Krishnan. All the 13th Sections of the Congress had their separate sessions and the attendance of Ordinary and Full Session Members was good. The *General Committee* met once during the year under the Chairmanship of Sir K. S. Krishnan and discussed several matters regarding the general policy, administration and the lines on which the future policy of the Association should be directed for the expansion of the activities of the Association. A detailed Report will be found in Part I of the Proceedings of Thirty-Sixth Session which has already been circulated to all Honorary and Ordinary Members.

Obituary: With deep regret we have to report the death of two of our distinguished past General Presidents—Professor Birbal Sahni and Sir Ardeshir Dalal—and one of our prominent members, Prof. Benoy Kumar Sarkar. In the early death of Prof. Sahni, India has lost a Scientist-leader of an outstanding character who had dedicated his life to the cause of science and who had been responsible for raising the status of Indian Science in the eyes of the World. Condolence messages were sent on behalf of the Association to the bereaved families.

EXECUTIVE COMMITTEE

The Executive Committee (consisting of 17 Members) met 7 times since the last Allahabad Session. The 7th meeting which was held on 9th December was an Emergency meeting. The meetings were generally held in the Headquarters office of the Association at calcutta. Of the members of the Executive Committee, Prof. P. C. Mahalanobls, Dr. B. C. Guha, Dr. D. S. Kothari, Prof. B. Narayana, and Dr. Baini Parasad were out of India on tour during different periods of the year.

Additional Member of the Executive Committee: The question of nominating a representative of the Department of Scientific Research in the Managing Bodies of Scientific Societies and Research Institutions was raised by the Government of India and the Indian Science Congress Association was asked to consider the proposal in one of the meetings of the Executive Committee. In view of the fact that Government of India gives a grant to the Indian Science Congress Association and in order to secure better cooperation from the Government, the Executive Committee accepted the request of the Government to include a scientist nominated by the Government of India as an *additional member* of the Executive Committee. This will require a change of the Rules of the Association and it was recommended that the changes required should be put before the Council and the General Committee for their approval.

Shifting of the dates of the Science Congress Session: The question of changing the dates of the Science Congress Session had been before the Executive Committee for the last 3 years and several members suggested that back-dating of the Science Congress Session from 2 to 8 January to the 3rd week of December (16 to 23 December) prior to the starting of the Christmas holidays would be helpful in many ways. Last year the question was taken up at the General Committee Meeting but no decision was arrived at. This year a request has been received from the Institution of Engineers (India) either to back-date the Session of the Congress to the last week of December or to post-date it to the last week of January or the first week of February in order to avoid a clashing of dates between the two meetings and to enable the scientists and engineers, who are arriving in India in connection with the World Power Conference and the International Association for Hydraulic Structures Research to attend the sessions of the Indian Science Congress. The matter was discussed at the meeting of the Executive Committee but no decision could be arrived at. It was the feeling of the Executive Committee that in view of the commitments already made by the Association to the proposed session of the Pan-Indian Ocean Science Congress in India either immediately preceding and after the session of the Science Congress in 1951, it might not be desirable to change the dates of the 1951 session. The Centenary Celebrations of the Geological Society of India is also scheduled to be held towards the end of December or early January. Unless full information is available on all these issues, it was considered too premature to take any decision on this question.

Pan Indian Ocean Science Congress: Prof. A. D. Ross, Chairman of the Australian National Research Council, approached the Indian Science Congress Association and the National Institute of Sciences of India to organise a Pan-Indian Ocean Science Congress along with or immediately after the 1951 Session of the Indian Science Congress, on the lines of the Pan-Pacific Ocean Congress organised by America a few years ago. He suggested that such a congress would be able to discuss many scientific and techonological problems peculiar to this zone of the World and would also further the cause of international science. The Executive Committee approved the idea and approached the Department of Scientific Research for opinion of the Government of India in this matter. Sir S. S. Bhatnagar and other members

of the Council of the Association have also supported the idea. Details of organisation have yet to be worked out but it is now definite that the first Session of this proposed Congress will be held in India and the Indian Science Congress Association would be in charge of the arrangements, etc.

Co-operation with sister Organisations in India and abroad: Prof. J. N. Mukherji has been elected to the Governing Body of the Indian Research Fund Association as a representative of the Indian Science Congress Association for a period of 3 years from December 1948. Prof. P. C. Mahalanobis and Dr. B. Mukerji were nominated by the Indian Science Congress Association to the Council of the National Institute of Sciences of India as an additional Vice-President and an additional Member respectively for the year 1950.

The Indian National Commission for Cooperation with the UNESCO was formed during the year and the Ministry of Education requested the Indian Science Congress to nominate *four* representative to the Scientific Sub-commission of that body. The President, Sir K. S. Krishnan, the President-elect, Prof. P. C. Mahalanobis and two General Secretaries, Dr. B. Mukerji and Dr. Sanjiva Rao represented the Association at the inaugural meetings at New Delhi. The Association was also requested by the Ministry of Defence to nominate a delegate to attend the Defence Science Conference which was organised for the first time in India. Dr. B. Mukerji and|or Dr. A. C. Ukil were nominated as delegates to attend the conference. In both these cases, the I. S. C. A. undertook no financial commitments towards travel and other expenses of the delegates.

The British Association for the Advancement of Science extended an invitation to the Indian Science Congress Association to send representatives at their annual meeting held at New-Castle-upon-Tyne from 31st August to 7th September, 1949. The Executive Committee decided that in view of the likely presence of the Indian Scientific Delegation for the Lake Success meeting in London at that time, it would be advisable to request all the members of that delegation who are also members of the Association to attend the British Association Annual Meeting. The following names were communicated to the British Association as Indian Science Congress Association's delegates: Sir S. S. Bhatnagar, Prof. P. C. Mahalanobis, Sir K. S. Krishnan, Sir J. C. Ghosh, Dr. J. N. Mukherjee and Dr. S. L. Hora. The Executive Committee further suggested that Prof. S. Bhagabantham, Scientific Liaison Officer in the High Commissioner for India in London, should also attend the meeting on behalf of the Indian Science Congress Association. In the absence of Prof. Bhagabantham from London, His Execellency the High Commissioner for India in London appointed two members of his staff Dr. V. S. Shemberkar and Dr. B. N. Mukherjee—to be present at the British Association Meeting as observer-delegates on behalf of India. At this meeting, Prof. P. Auger, Head of the Natural Science Department of UNESCO, discussed the desirability of forming a 'World Federation of Associations for the Advancement of Science'. This proposal was forwarded for consideration of the Executive Committee and it was felt that before committing the Association to any definite opinion on the subject, further elucidation of the specific objectives of such a World Federation should be called for.

The Indian Science Congress Association was invited to send a representative to be present on the occasion of the dedication of the Institute of Physics and Physical Chemistry and the laying of the corner-stone of the Institute of Experimental Biology of the Weizmann Institute of Science, Rehovoth, Israel. The Executive Committee decided to send messages of greetings and requested the Department of Scientific Research, Government of India, to send an Indian Scientist to Israel on government expense, if possible.

Messages and telegrams expressing the good-will and felicitation of the Indian Science Congress Association were sent to the Institute of Paleobotany, Lucknow, Roorkee University, Ceylon Association of Science, Society for the Study of Industrial Medicine, and many other institutions.

GENERAL ADMINISTRATION

Drs. B. Mukerji and B. Sanjiva Rao, the General Secretaries, carried on the administration of the Association during the period under review. As an economy measure, the post of Assistant Secretary was not filled on the recommendation of the Executive Committee and this naturally placed a lot of burden on the General Secretary at the headquarters of the Association at Calcutta. However, through the co-operation of the Members of the Executive Committee, the office work was not permitted to suffer and all arrear work has also been completed. A branch office is also functioning at Bangalore under Dr. B. Sanjiva Rao.

Government of India Grant-in-aid:—It will be recalled that for some years past the Association had been trying to impress on the Government of India the need for an annual recurring grant of Rs. 25,000|- for carrying out its scientific activities, for maintaining its office on a high level of efficiency and for the regular publication of its Proceedings. The cost of paper, printing and overhead charges in connection with dearness and other allowances have increased considerably during the last few years and the income of the Association from the membership subscriptions alone is not adequate to meet all these demands. Due to an all-round economy drive by the Government of India, it has not been possible for the Association to receive the grant of Rs. 25,000|- but a grant of Rs. 15,000|- has been received during 1949-50. There is no certainty whether this grant would be forthcoming next year. In order to make the Association self-sufficient in the matter of finances, the Executive Committee recommended an increase in the membership subscription from Rs. 12|- to Rs. 15|-. Though the printing charges and cost of paper, etc. have increased nearly fourfold during recent years, there had not been any increase in membership subscription. This recommendation of the Executive Committee had already been circulated to all Council Members and some replies had been recived approving of the suggestion. In this connection it may be pointed out that the Govt. of India in the Department of Scientific Research are strongly in favour of this suggestion. This recommendation will be considered at the General Committee meeting in Poona in January, 1950 for final ratification.

Association Office: With the increase of the work of the Association it is being felt that the limited accommodation, which the Association has at present in the premises of the Royal Asiatic Society of Bengal, will no longer be adequate for the purpose. The Association, therefore, tried to secure additional accommodation, particularly for the maintenance of its old publications, records, papers, etc. So far no success has been achieved in this direction. The question of buildings a separate house for the accommodation of all scientific Bodies with their head offices in Calcutta, on the lines of the Burlington House in London, has been taken up recently and discussed in several meetings of the Mining, Geological and Metallurgical Institute of India, Calcutta. The Science Congress Association was invited to send representatives to this meeting and Mr. B. K. Sarkar, one of the members of the Executive Committee, represented the Association in this body. The details of payment, etc have not yet been finalised but there seems to be some possibility that the project will materialise, and in that case, the Association has been assured suitable accommodation in that building, both for its office and for its lecture and symposia rooms. There is definite need for a building of this type and the sooner such a project is brought to fruition the better for all scientific with their headquaraters in Calcutta. The funds of the Association are not enough to construct a building of its own.

Membership Drive: As a result of the last world war and various other difficulties, no effort was made for some years to increase the membership of the I.S.C.A., which was showing a tendecy to decline. The Executive Committee therefore felt that a 'membership drive' at this stage would be necessary and at their request, the General Secretary, Dr. B. Mukerji, prepared a small pamphlet giving the objects and scope of the Association and the good work that this Association had been doing in the past. This pamphlet was distributed to all Ordinary, Full Session and other Members and each Member was requested to exert his personal influence to add at least one more 'Ordinary Member' to the list of members of the Association. This drive has shown some response but it not adequate. The American Association for the Advancement of Science has nearly 33,000 members but the I.S.C.A. membership still does not exceed the 2000 figure. It is proposed to maintain this 'menbership drive' next year also, so that more and more younger scientists would be brought within the fold of this Association.

Provident Fund Scheme for employees: For some years past, efforts were made to create a Provident Fund Benefit scheme for the employees of the Asssciation. During this year definite shape was given to this programme and now the employees of the Association are entitled to the benefits of Contributory Provident Fund, as has been approved in many similar non-official Institutions.

Printing of Proceedings: Due to shortage of paper and printing difficulties, the Proceedings could not be issued regularly since 1945. Through a determined effort of the Calcutta Office, this position has now been neutralised and this year all the 4 parts of the Proceedings of the Allahabad Session has already been printed and circulated. It is proposed to stick to this regular schedule in future years.

In pursuance to the recommendation of the Council not to publish Abstracts of papers, which are not accompanied with *full papers,* a circular letter was issued to all members bringing pointedly to their notice the provisions of Rule 34, which demands that Abstracts of papers must be submitted for printing with their *full papers* to the General Secretary before 15th September. As a result of this, the number of Abstracts received this year has been lower than usual, and many Abstracts have been refused publication because they were not accompanied with full papers. From next year it has been suggested that Abstracts should also carefully edited by the Sectional Presidents, so that no Abstracts would exceed the 200-line limit recommended under the Rules of the Association. The Executive Committee have also prepared a set of instructions on 'Editorial Guidance' for papers with the co-operation of Mr. J. Coates, President of the Section of Geology & Geography, 1949-50 and it is proposed to circulate this to all Sectional Presidents for future guidance and compliance.

WORK OF DIFFERENT SUB-COMMITTEES

(*i*) *Sub-Committee to consider the various implications of Dr. D. D. Karve's letter*: At the last Allahabad Session of the Congress, Dr. Karve addressed a letter to the General Secretary, I.S.C.A., bringing out certain specific suggestions for the re-organisation of the I.S.C.A. and also suggested a modification of the present system of election of members to the Executive Committee and Sectional Committees. The Executive for the year 1949 considered this letter in its very first meeting, and appointed a Sub-committee consisting of Prof. P. C. Mahalanobis (Convenor), Dr. S. K. Mitra, Dr. S. L. Hora, Dr. D. D. Karve, Dr. P. K. Ghosh, Dr. B. Mukerji and Dr. B. Sanjiva Rao (General Secretaries) to discuss the various implications of Dr. Karve's letter, *inter alia,* taking into consideration the present Rules and Regulations of the I.S.C.A. Later, Prof. Mahalanobis declined the Convenorship of this Sub-Committee and it was

suggested that the meetings should be held on invitations being issued by the General Secretaries. In order to get the opinion of Dr. Karve, Dr. B. Sanjiva Rao, the General Secretary at Bangalore, was requested to contact Dr. Karve and get his opinion on some of the points raised by him. Prof. Sanjiva Rao made a report after consulting Dr. Karve and suggested that the best solution of the problem would be to have the members of the Executive Committee of the I.S.C.A. elected on zonal basis, so that the Association could get a real all-India representation. The matter was considered by the members of the Sub-committee specially constituted for the purpose and was referred back to the Executive Committee. The Executive Committee thought that at this time when inter-provincial amity and good will have to be created on all fronts, it would be a retrogade step to adopt the zonal system of election and felt that the existing practice of free election of members from all over India would be in the best interests for the democratic background of the Association. However, the Committee felt that the question of zonal election should be again gone into in further detail by another Sub-committee consisting of Dr. U. P. Basu (Convenor), Dr B. C. Guha, Prof. J. M. Sen, Dr. S. L. Hora and one of the General Secretaries. As the matter required very careful and detailed consideration, it was felt that rushing through such a decision would not be to the best interest of the Association, and it was decided to consider the matter again next year.

(*ii*) *Sub-Committee on Scientific Development of Andaman and Nicobar Islands*: On the suggestion of Mr. B. K. Majumdar the Association appointed a Sub-committee to report on the scientific development of the Andaman and Nicobar Island with particular reference to the colonization scheme, which was then prominently in public view. Mr. B. K. Majumdar was appointed Convener of this Sub-committee but as he had to be out of station for some time, Dr. A. K. De was later appointed Convener of this Sub-committee.

(*iii*) *Sub-Committee to devise ways and means for improving the financial position of the Indian Science Congress Association*: In view of the increasing expenditure towards printing etc. of the Association, the Executive Committee appointed a Sub-committee to devise ways and means for improving the financial position of the Association. This Subcommittee was constituted by Dr. K. N. Bagchi, Treasurer (Convener) Mr. B. K. Sarkar, Dr. U. P. Basu, Dr. S. L. Hora and the General Secretaries. This Subcommittee suggested that the appointment of the Assistant Secretary should be withheld for some time and that the number of Abstracts being printed should be substantially reduced. Both these steps were taken during the year under review.

(*iv*) *Sub-committee to draft reports for UNESCO, Paris*: The office of the UNESCO requested the Indian Science Congress Association to prepare and submit reports on the four following subjects: (*a*) Means of extending collaboration between Association for the Advancement of Science, (*b*) The Science Club Movement, (*c*) Popularization of Science through cheap books and clubs and (*d*) The interaction between science and society. A sub-committee consisting of Dr. B. C. Guha (Convenor), Prof. J. M. Sen, and Mr. S. N. Sen (originally of the NUESCO, Paris) was constituted to look into this matter. The Sub-committee decided that the contracts of the UNESCO in this connection should be accepted by the Indian Science Congress Association, and that Mr. S. N. Sen should be requested to prepare the four reports on behalf of this Association. It was also agreed that Mr. Sen should be given an honarorium for this work from the funds that are being placed at the disposal of the Association by the UNESCO for this particular purpose.

(*v*) *Sub-Committee on 'Science and its Social Relations'*: This sub-committee continued to function with Prof. J. M. Sen as its Convenor during the year under

review. As usual, a special symposium on 'Application of Science in India for Social Welfare' was held at the Vizianagram Hall, Allahabad University, Allahabad, under the auspices of this Subcommittee and was presided over by Sir K. S. Krishnan. A report of this had already been published in Part IV of the Allahabad Proceedings. This year, a symposium on 'Engineering Developments in India in relation to Social Welfare' has also been organised at Poona and this symposium is likely to attract a number of important speakers.

(*vi*) *Finance Committee*: Mr. H. L. Sen Gupta, and Ordinary Member of the Association was appointed to the Finance Committee for 1949-50. According to Rules, the membership of this Committee is open only to resident members of the Association in Calcutta so that bills, etc. could be checked, etc., from time to time.

VISIT OF FOREIGN SCIENTISTS

It would be recalled that during the last Allahabad Session, several foreign scientists, such as Sir Robert Robinson, Prof. H. Mark, Prof. Szent Gyorgyi, Prof. C. H. Best, J. H. Burn, Prof. and Madame Joliot-Curie and Prof. D. Englehardt, were invited to attend the session, but due to the late receipt of the invitation none were able to honour the request. Only Prof. S. Chapman (Grant Britain) and Mr. Govind Behari Lal (America) attended the Allahabad session. The Executive Committee discussed the position and decided that in view of the commitments alrerdy made and in view of the delay that occurred in the issuance of invitation last year, it is only proper that foreign scientists who were invited last year but who could not make it convenient to come to India, should again be invited this year, as early as possible, with the concurrence of the Department of Scientific Research of the Govt. of India. It was, therefore decided that the following scientists should be invited immediately: Sir Robert Robinson, (Gt. Britain) Prof. and Madame Curie Joliot (France), Prof. Herman Mark (America), Prof. Szent Gyorgyi (originally of Hungary, now residing in the U.S.A.), Prof. C. H. Best (Canada), Prof. J. H. Burn (Great Britain), and Prof. Desmond Bernal (Great Britain). It was further decided that if funds were available, 4 other foreign scientists should also be invited, comprising as many aspects of science as possible. For the selection of these 4 scientists, it was decided to seek the opinion of the members of the Council and the final selection be made with the approval of the Department of Scientific Research. The Government of India in the Department of Scientific Research agreed with the above decision and invitations were immediately sent to the above mentioned scientists through the respective Indian Embassies. Prof. J. H. Burn, Prof. C. H. Best and Prof Szent Gyorgyi expressed their inability to come to India to attend the Poona Session and Department of Scientific Research invited Dr. E. U. Condon (America) and Prof. D. Englehardt (Russia) in the vacancies caused by the non-acceptance of the three scientists mentioned above to come to India. According to the latest information, it is now known that the following scientists are definitely attending the Poona session in 1950: Prof. Sir Robert Robinson, Prof. Desmond Bernal, Prof. and Madame Joliot-Curie, Prof. Herman Mark, Dr. E. U. Condon. The Government of India in the Department of Scientific Research sanctioned an amount of Rs. 57,800/- this year in connection with the expenses of travel, accommodation, stay, etc. of the foreign scientists in India.

Prof. P. C. Mahalanobis, President-elect, suggested in one of the meetings of the Executive Committee that it would be desirable also to invite the overseas scientists who are available in India to attend the Poona session, so that the work of the Association would be known to as many people as possible. In this connection he suggested that the following scientists be invited to attend the Poona: Prof. A. H. Compton (U.S.A.), Prof. P. Auger (Scientific Secretariat, UNESCO, Paris) Prof.

O. E. H. Rydbeck (Sweden), Prof. Herman Wold, (Uppsala University, Sweden), Dr. Walter Zander, (U.K.), Dr. C. P. G. J. Smit (FAO and UN), Dr. M. J. Miller (Canada), Prof. Marshall Stone, Dr. S. Trone, Dr. Harold Fisher, etc. It was agreed that the expenses for their stay at Poona during the session would be met from the funds of the Association, which will be later recouped from the surplus money that would remain under foreign scientists' account. The General Secretary was requested to get in touch with Dr. S. S. Bhatnagar, Secretary to the Govt. of India, Department of Scientific Research, to get this position regularised.

COUNCIL MEETING

The Council meeting, which was held on 14th January 1949 at the Muir College Building, Allahabad, discussed ways and means for improving the work of the Association. This meeting was presided over by Prof. S. N. Bose. The desirablity of increasing the membership subscription from Rs. 12|- to Rs. 15|- was fully discussed from all angles, but this proposal did not find favour with many members of the Council. Many members pointed out that economy should be effected in the day-to-day administration, & publication of the Association rather than burden the members with additional fees, which will restrict the entry of younger scientists into the fold of the Association. The question was therefore deferred for consideration next year. During the year under review, the question was again opened through a circular letter issued to all Council Members and this year many members replied, expressing their willingness to the suggestion. The Government of India in the Department of Scientific Research after carefully considering the financial position of the Association strongly suggested an increase in membership subscription from Rs. 12|- to Rs. 15|-.

The Council also approved of the idea of holding the Pan-Indian Ocean Science Congress along with or immediately after the Science Congress session in 1951.

A proposal was mooted last year for the preparation of a 'Scientific Directory' in 1950 but due to financial stringency, the Executive Committee did not approve of the idea and suggested that the question be deferred for more favourable times. Therefore the matter was not brought before the *Council* for further consideration.

GENERAL COMMITTEE

The Executive Committee would like to receive suggestion *in writing* from the members themselves for improving the work of the Association. The out-going Executive Committee would request the general body of members to help the Association through their personal influence by enlising more 'Ordinary Members', so that active interest of the members could be focussed through the year on the activities of the Association. With this idea in view, the Executive Committee issued a pamphlet to popularise the aims and objects of the Association. It is being noticed during the last few years that many scientists get themselves enlisted as 'Sessional Members' at the last minute, thereby creating a large shifting membership, which does not help to strengthen the Association. Below is given in a tabular form as zonal distribution of 'Ordinary Members' as on 1st November, 1949.

Bengal	..	..	..	37.6 per cent.
Bombay	..	..	..	16.1 „ „
U. P.	..	..	..	11.3 „ „
Delhi	..	..	..	7.4 „ „
Bihar & Orissa	..	..	..	6.9 „ „
Madras	..	..	..	5.4 „ „

Mysore	..	..	..	3·3	„ „
C. P. & Berar	..	..	..	2.3	„ „
C. I. & Rajasthan	..	..	..	2.8	„ „
Hyderabad	..	..	..	1.9	„ „
Assam ..	..	..	..	1.3	„ „
East Punjab	..	..	..	1.2	„ „
Travancore & Cochin		..	..	0.7	„ „
Kashmir, Ceylon, Foreign and Pakistan			..	1.8	„ „
				100.0	

Obviously there is need for increasing the influence of the Association in southern, western, central and north western zones. The co-operation of all regular members is earnestly sought in increasing the number of Ordinary Members specially in these areas.

BUDGET AND ACCOUNTS

Budget estimates for the year 1948-49 are given in pages *i* to *xiii*. It will be noticed that the expenditure of the Association has increased considerably. This is only natural because of the all round increase in paper price, cost of printing, staff salary, dearness and other allowances, postal charges, building rents, etc. The urgent need for an increase in the membership fee from Re. 12|- o Rs. 15|- is justified when the steady increase in expenditure is taken into account. This year the budget has been balanced as result of the generous grant of Rs. 15,000|- from the Government of India. The Association should not depend on Government grant as a regular measure. In the interest of continuity of work of the Association and with a view to develop it further, the members are requested to give their serious consideration to the proposal for an increase in membership subscription, which is being put forward.

Calcutta, the 24th December, 1949

B. Mukerji,
B. Sanjiva Rao,
General Secretaries

10. MEETING OF COMMITTEE

GENERAL COMMITTEE

A meeting of the General Committee of the Indian Science Congress Association was held at the Fergusson College Building, Poona, at 2-30 P.M. on Thursday, the 5th January, 1950. The General President, Prof. P. C. Mahalanobis, was in the chair.

The following members were present:—

Mr. A. Abraham, Mr. N. Adhikari, Dr. S. P. Agharkar, Prof. S. V. Chandrasekhar Aiya, Mr. V. V. Apte, Dr. D. V. Bal, Dr. B. Banerjee, Dr. S. Banerjee, Dr. K. Banerji, Dr. C. Barat, Dr. B. C. Basu, Dr. N. M. Basu, Dr. S. Basu, Dr. U. P. Basu, Mr. P. M. Bhargava, Dr. L. J. Bhatt, Dr. N. B. Bhatt, Dr. G. Bhattacharya, Prof. B. V. Bhide, Dr. P. C. Biswas, Dr. A. N. Bose, Dr. A. K. Bose, Dr. S. R. Bose, Prof. S. N. Bose, Mr. S. P. Capoor, Dr. D. K. Chakraborty, Mr. S. K. Chakraborty, Mr. G. L. Chandratreya, Mrs. S. K. Chatterji, Dr. S. K. Chatterjee, Dr. M. L. Chatterjee, Mr. A. C. Chatterjee, Dr. B. K. Chauhan, Mr. K. A. Chowdhury, Dr. G. W. Chiplonkar, Dr. M. W. Chiplonkar, Dr. J. K. Choudhury, Mr. J. Coates, Miss. S. S. Corley,

Mr. B. K. Das, Dr. G. C. Das-Gupta, Dr. D. S. Datar, Mr. K. L. De, Dr. P. J. Deoras, Dr. R. D. Desai, Mr. A. De Souza, Dr. K. R. Dixit, Dr. K. K. Dole, Mr. S. K. Ekambaram, Mr. A. K. Ganguly, Mr. C. S. Ghosh, Mr. N. L. Ghosh, Dr. T. N. Ghosh, Dr. R. N. Ghosh, Mr. N. C. Ghosh, Dr. S. L. Hora, Mr. S. G. Iyer, Dr. G. V. Jadav, Mr. V. N. Jai, Dr. S. Jalota, Mr. N. S. Joshi, Mr. B. B. Joshi, Mr. C. B. Joshi, Mr. N. V. Joshi, Dr. D. V. Karmakar, Miss. T. R. Kundaji, Mr. F. S. Khambata, Mr. B. D. Kochhar, Mr. L. S. Krishnan, Mr. A. N. Kappanna, Dr. R. C. Lacy, Mr. K. B. Madhava, Dr. L. D. Mahajan, Prof. P. C. Mahalanobis, Dr. D. R. Malhotra, Mr. G. G. Majumdar, Prof. G. P. Majumdar, Mr. B. N. Mehta, Mr. S. M. Mehta, Dr. R. C. Misra, Dr. R. Misra, Dr. K. Mitra, Dr. B. Mukerji, Mr. J. N. Muthuswami, Dr. P. Nandi, Mr. M. C. Nath, Dr. M. C. Nath, Mr. S. P. Phadke, Mrs. Pramila Phatakm, Mr. S. Pradhan, Mr. S. K. Pramanik, Swami Pranavananda, Dr. P. B. Patnaik, Dr. C. Racine, Dr. M. V. Radhakrishna Rao, Mr. S. A. Rahman, Mr. D. V. Rajalakshman, Mr. M. A. Ramaswami, Mr. J. N. Ray, Dr. S. P. Ray Choudhuri, Mr. M. N. Rudra, Mr. T. S. Sadsivan, Mr. Sanghi Indu, Dr. B. Sanjiva Rao, Prof. P. C. Sarbadhikari, Mr. B. K. Sarkar, Dr. S. N. Sarkar, Dr. N. S. N. Sastry, Prof. J. M. Sen, Mr. J. R. Sen, Dr. M. K. Sen, Mr. P. Sen, Mr. N. C. Sen Gupta, Mr. Sethna Suresh, Mr. J. C. Shah, Mr. N. K. Shah, Dr. N. M. Shah, Dr. R. C. Shah, Mr. N. L. Sharma, Mr. H. N. Srivastava, Mr. R. P. Sinha, Dr. H. Srinivasa Rao, Dr. P. V. Sukhatme, Mr. D. C. Tapadar and others were present.

(1) *Minutes Dated 6th January 1949 Confirmed.* The minutes of the last meeting of the General Committee held on 6th January, 1949 (circulated) were taken up for consideration. There were no objections and the minutes were confirmed.

(2) *Annual Report Audited Accounts for 1948-49 and the Budget Estimates for 1949-50.* The annual report of the Executive Committee, audited statement of Account for the year ended 30th November 1949, and the Budget Estimate for the year 1949-50 already circulated were then considered. Dr. B. Mukerji, General Secretary, placed before the meeting, the Annual report, Audited statement of accounts and the budget estimates. There were some discussions on the budget estimates, in which several members participated but ultimately no specific objection was raised and it was adopted.

(3) *Increase of Membership subscription* from Rs. 12|- to Rs. 15|- was hen taken up for consideration. Many members participated in this item and some of the members were in favours of increasing the membership fees some were against this proposal. Prof. P. C. Mohalanobis, President, after careful consideration, put the matter for voting before the meeting. It was then voted by raising hands. As the majority were not in favour of increasing the membership subscription, the discussion was pospond for the next year.

EXECUTIVE COMMITTEE AND COUNCIL

(4) *Announcement of the names of the Executive Committee members and the Council.* Dr. B. Mukerji General Secretary, reported the following resultes of the elections of members to the Executive Committee and the Council for the year 1950-51.

Executive Committee:—Dr. K. N. Bhal, Lucknow; Prof. S. N. Bose, Calcutta; Dr. P. K. Ghosh, Calcutta; Prof. P. C. Guha, Bangalore; Dr. D. S. Kothari, New Delhi; Dr. B. C. Kundu, Hoogly; Prof. S. K. Mitra, Calcutta; Dr. B. N. Prasad; Patna; Prof. L. Rama Rao, Bangalore; Mr. B. K. Sarkar, Calcutta;

Council:—Mr. K. L. Dey, Calcutta; Mr. A. M. N. Ghosh, Calcutta; Dr. B. C. Basu, Calcutta; Mr. B. K. Majumdar, Calcutta; Prof. M. A. Moghe, Nagpur; Mr. S. N. Roy-Chowdhuri, Calcutta; Dr. A. C. Ukil, Calcutta;

(5) *Announcement of the name of the General President for the year 1951.* Prof. P. C. Mahalanobis (General President) announced that the Executive Committee

had recommended the election of Dr. H. J. Bhabha, F.R.S., as the General President for the 1951 Session. The proposal was cofirmed by acclamations.

(6) *Announcement of the names of he Sectional Presidents and Recorders for* 1951 *Session.* Dr. B. Mukerji, General Secretary, announced the names of Sectional Presidents and Recorders for 1951 as follows:—

Sections.	Presidents.	Recorders.
1. *Mathematics,*	Dr. C. Racine, Madras;	Mr. V. V. Narilikar, Banaras.
2. *Statistics;*	Mr. A. R. Sinha, Calcutta,	Dr. K. R. Nair, Dehra Dun.
3. *Physics;*	Dr. G. S. Venkataswaran, Trivandrum;	Prof. K. R. Dixit, Bombay.
4. *Chemistry;*	Dr. R. C. Shah, Bombay,	Dr. T. R. Seshadri, Delhi.
5. *Geology & Geography;*	Dr. J. B. Auden, Calcutta,	Prof. S. C. Bose, Calcutta.
6. *Botany;*	Dr. B. B. Mundkar, New Delhi,	Dr. I. Banerjee, Calcutta.
7. *Zoology & Entomology;*	Dr. N. C. Chatterjee, Dehra Dun,	Dr. L. S. Ramswami, Mysore.
8. *Anthropology & Archaology;*	Dr. S. S. Sarkar, Calcutta,	Mr. V. D. Krishanaswami, Madras.
9. *Medical & Veterinary Sciences;*	Dr. G. Sankaran, Calcutta,	Dr. A. K. Hazra, Bombay.
10. *Agricultural Sciences;*	Dr. J. K. Basu, Solapur,	Dr. S. P. Roy Choudhuri, New Delhi.
11. *Physiology;*	Prof. S. M. Banerjee, Cuttack,	Prof. D. V. Subba Reddy, Madras.
12. *Psychology & Educational Sciences;*	Mr. S. K. Bose, Calcutta,	Miss. S. B. Gupta, Calcutta.
13. *Engineering & Metallurgy;*	Prof. M. S. Thacker, Bangalore,	Mr. K. L. Dey, Calcutta.

(7) *Venue of the next annual session* (1951)—Prof. P. C. Mahalanobis, President, announced that the invitation to hold the next session of the Congress in 1951 had been received from the University of Calcutta. It was therefore considered desirable to hold the next session at Calcutta and was also confirmed.

(8) *Election of two members to each of 13 Sectional Committee.* The General Committee then proceeded with election of members to each of the 13 Sectional Committees. After the names were proposed and duly seconded, the following elections were made by majority of votes:—

Mathematics:— (*a*) Mr. G. L. Chandratreya, Poona.
(*b*) Dr. S. K. Basu, Calcutta.

Statistics:— (*a*) Mrs. Chameli Bose, Calcutta.
(*b*) Mr. S. K. Banerjee, Bombay.

Physics:— (*a*) Dr. S. R. Khastagir, Banaras.
(*b*) Dr. N. B. Bhatt, Delhi.

Chemistry:—	(*a*) Dr. S. M. Das Gupta, Delhi.
	(*b*) Mr. S. M. Mehta, Bombay.
Geology & *Geography*:—	(*a*) Dr. A. K. Dey, Calcutta.
	(*b*) Dr. R. C. Misra, Lucknow.
Botany:—	(*a*) Dr. P. N. Nandi, Calcutta.
	(*b*) Dr. D. Chatterjee, New Delhi.
Zoology & *Entomology*:—	(*a*) Dr. P. J. Deoras, Bombay.
	(*b*) Dr. S. P. Roy Chowdhury, Calcutta.
Anthropology & *Archaeology*:—	(*a*) Mrs. Freda Mukherjee, Delhi.
	(*b*) Mr. B. B. Varma, Delhi.
Medical & *Veterinary*:—	(*a*) Dr. P. C. Sen Gupta, Calcutta.
	(*b*) Dr. A. N. Bose, Calcutta.
Agriculture:—	(*a*) Dr. P. N. Bhaduri, Calcutta.
	(*b*) Dr. C. C. Shah, Annad.
Physiology:—	(*a*) Miss. Sujata Chaudhuri, New Delhi.
	(*b*) Dr. Sachchidananda Banerjee, Calcutta.
Psychology & *Educational*:—	(*a*) Mrs. Promila T. Pathak, Baroda.
	(*b*) Mr. Samiran Banerjee, Calcutta.
Engineering & *Metallurgy*:—	(*a*) Mr. H. N. Srivastava, New Delhi.
	(*b*) Mr. Chandra Sekhar Ghosh, Bangalore.

(9) The Audited Statement of Receipts and Payments for year ending 30th November, 1949 was adopted.

(10) The Budget Estimates for the year 1st December 1949 to 30th November 1950 were approved.

(11) The Secretary reported that Sir, S. S. Bhatnagar, F.R.S., secretary to the Govt. of India, Dept. of Scientific Research, New Delhi, or his representative will be nominated as an additional member in the Executive Committee. He also reported that the Pan Indian Ocean Science Congress will be held jointly with Indian Science Congress at Calcutta in January 1951.

VOTE OF THANKS

(12) The following vote of thanks were unanimously adopted:—

(*a*) To His Excellency the Governor of Bombay for consenting to be the Patron of the Association for 1950 session at Poona, proposed by the President.

(*b*) To Hon'ble Dr. Syama Prosad Mukherjee, Minister-in-Charge of Industries and Supplies, for inagurating the session of the Congress, proposed by Dr. B. Mukerji.

(*c*) To Hon'ble Prime Minister Pandit Jawharlal Nehru, for his presence at the meeting, proposed by Prof. P. C. Mahalanobis.

(*d*) To Hon'ble Prime Minister of Bombay, proposed by Prof. P. C. Mahalanobis.

(*e*) To the Vice-Chancellor and the University of Poona, proposed by Dr. B. Mukerji.

(*f*) To the Local Reception Committee, proposed by Dr. B. Sanjiva Rao.

(*g*) To the Local Secretaries, Proposed by Dr. B. Mukerji.

(*h*) To the Treasurer of the local Reception Committee, proposed by Dr. K. N. Bagchi.

(*i*) To the Volunteers, proposed by Dr. B. Mukerji.

(*j*) To the President, proposed by Dr. B. Sanjiva Rao.

(*k*) To the General Secretaries proposed by Dr. S. L. Hora.

(*l*) To the Tresurer, proposed by Prof. S. V. Aiya.

(*m*) To Foreign Scientists who came from abroad for attending the Congress proposed by Dr. B. Mukerji.

COUNCIL MEETING: POONA SESSION

A meeting of the Council of the Indian Science Congress Association was held at the Fergusson College Buildings, Poona at 5 P.M. on Sunday the 1st January, 1950. As the President, Prof. P. C. Mahalanobis. was busy elsewhere, Dr. J. N. Mukherjee presided.

Present: Dr. S. P. Agharkar, Mr. J. Coates, Dr. J. K. Choudhury, Mr. B. K. Sarkar, Dr. W. D. West, Dr. B. C. Basu, Dr. D. Chakraborty, Prof. P. C. Mitter, Prof. S. V. Chandrasekhar Aiya, Dr. D. S. Kothari, Dr. B. C. Guha, Dr. A. K. Dey, Dr. P. Maheswari, Dr. B. V. Bhide, Mr. A. M. N. Ghosh, Dr. B. Mukerji (General Secretary).

PROCEEDINGS

1. The minutes of the meeting held on 4th January, 1949, at the Vizianagram Hall, Muir College Building, Allahabad (already circulated) were confirmed.

2. The recommendation of the Executive Committee regarding the need for increasing the membership subscription and the letter from the Under Secretary to the Govt. of India, Dept., of Scientific Research suggesting an increase in the membership Subscription from Rs. 12|- to Rs. 15|- were then taken up for consideration. The Secretary reported that the matter had already been throughly considered by the Executive Committee and the Council for the last two years. Though the Executive Committee recommended the proposal, the council turned it down. This time the Executive Committee again considered the question and recommended the increase of membership fees, not only because of increase in overhead expenditure but also because the Dept. of Scientific Research after mature consideration and after careful scrutiny of the financial returns of the Association strongly suggested an increase also so that the organisation could stand on its own legs in the near future.

Dr. S. P. Agharkar stated that it was not desirable to increase the membership subscription. He added that every effort should be made to reduce the running cost of the Association *e.g.,* Printing Cost, Appointment of an Assistant Secretary. etc. Dr. J. N. Mukherjee, Chairman pointed out from the Chair that appointment of an Assistant Secretary may be kept in abeyance for and this year, at least till intimation of the Government Grant is received. After examination of the balance sheet, he expressed satisfaction at the measures already taken by the General Secretary at Calcutta to keep expenses down. There appears to be no further room for economy excepting the non-recruitment of an Assistant Secretary for another term.

3. Consideration of the recommendation of the Executive Committee for inclusion of a Scientist nominated by the Government of India as an additional member of the Executive Committee of the Association; Resolved that Dr. S. S. Bhatnagar Secretary, Dept. of Scientific research of the Government of India, or his representative may be accepted as a member of the Executive Committee as an 'Additional' member.

4. Consideration of letter (see below) from P. C. Mahalanobis suggesting for the President-elect to take the charge of the office of the President immediately after the Session: The Council did not think it desirable to change the Rule immediately. The president elect of the next year should also be consulted and if the plan is approved, necessary modifications in the rules could be brought about next year.

5. Proposal for holding the Pan Indian Ocean Science Congress along with or immediately after the next session of the Indian Science Congress. Resolved that Pan Indian Ocean Science Congress might be held jointly with the Indian Science Congress with an extension of the Session for two days more, to accomodate additional subjects

or symposia. The proceedings of the two bodies however could be published separately. With a vote of thanks to the chair the meeting terminated.

Extract of the letter No. C 2654|19 dated 23rd January 1949 from Prof. P. C. Mahalanobis, President-elect addressed to General Secretary of the Indian Science Congress Association.

"There is one matter about which I have already spoken to you. In accordance with Rule 16, the President assumes charge just at the beginning of the Session, gives his address, and then acts as the President of the Executive Committee while the President-elect for the following year is a member of the Committee. I think a much better procedure will be for the President-elect to take charge of his office immediately after one session is over and to deliver his address and preside over the session at the end of his term of office. In this plan the President will be in office before he actually presides over the session and will be thus responsible for the arrangements for the session over which he presides. This is the practice of the American Association for the Advancement of Science and, I believe, of the British Association. I should, therefore, suggest a change in the Rules to enable the President assuming charge of his office immediately after his election and delivering his address and presiding over the session at the end of his term of office. There is only one difficulty in the transitional stage, namely, the President in whose term the proposed change comes into operation will not be able to act as the President of the Executive Committee. In order to facilitate the proposed change in the Rules, I should be very glad indeed to forgo the privilege of acting as the President of the Executive Committee. To be precise, I shall be glad if the Association will allow me to preside over the 37th session and immediately hand over charge of the office to the President-elect to preside over the 38th session. This will avoid the transitional difficulty. As you are aware, I am much interested in the programme of scientific delegations from abroad. According to present plans, I shall be going to Europe in the third week of April and to the U.S.A. in May and halt there for about a month. I am again due to go to Europe at the end of August or early September. If the Executive Committee so desires, I can try to contact personally as many of the invited scientists as possible with a view to persuading them to accept the invitation."

EXECUTIVE COMMITTEE

Ten meetings of the Executive Committee were held during the year 1949-50. The Annual Report published earlier gives the important items of business transacted excepting those done at the meetings held at Poona. Most of the business done at these meetings have been reported to the General Committee.

SUB-COMMITTEE ON SCIENCE AND ITS SOCIAL RELATIONS

A meeting of the Sub-Committee was held at Poona on Wednesday the 4th January 1950 at 2 P.M.

Members Present

Prof. P. C. Mahalanobis (in the Chair), Prof S. P. Agharkar, Dr. B. C. Guha, Mr. J. Coates, Dr. C. Von, F. Haimendorf, Prof. D. Kanga, Dr. D. R. Malhotra, Prof. Kali Prosad, Dr. B. Mukerji, and Prof. J. M. Sen (Convener).

1. Minutes of the meeting of the Sub-Committee held at Calcutta on the 14th September 1949, which had been previously circulated were confirmed.

2. The Annual Report for 1949, which was circulated to the members present, was then read by the Convener (Prof. J. M. Sen) and adopted.

3. With regard to the symposium on Engineering Developments in India in relation to Social welfare, the Convener stated that there were some conflicting items in the two programmes issued by the General Secretary's office and by the Local Secretary's Office. The two programmes gave two different dates for holding the symposium. Ultimately a reconcilation was effected by holding the symposium on Tuesday the 3rd January 1950, in the afternoon from 3 to 5 P.M. in conjunction with the Section on Metallurgy and Engineering under the presidency of Dr. D. R. Malhotra. The attendance was fairly large and it was felt that the attendance would have been larger if the programmes were not conflicting. The Convener reported that a pamphlet had been published and distributed at the symposium meeting giving the following aspects of the topic :—

(1) Engineering Developments in relation to Social Welfare in India (by Prof. M. S. Thacker, Officiating Director Indian Institute of Science, Bangalore) ; (2) River Conservation and Control (by Mr. S. C. Majumdar, Consulting Engineer to the Government of West Bengal Irrigation and Waterways Department) ; (3) The Damodar Valley Project in Relation to National Welfare (by Dr. B. C. Guha, Member, Damodar Valley Corporation) ; (4) Geological work on Dam Sites and Water-Supply Problems (by Mr. J. B. Auden, Superintending Geologist, Geological Survey of India).

The pamphlet also contained a short account of a declaration containing the Principles of a Charter for Scientists drawn up by the Committee on Science and its Social Relations instituted by the International Council of Scientific Unions at its meeting held at the UNESCO House, Paris, in June 1948. The pamphlet also contained the views of the Sub-Committee on Science and its Social Relations of the Indian Science Congress Association on the two following questions :—

(1) In which measure do the methods of international scientific works contribute to the creation of an international spirit and to the maintenance of peace?

(2) In which ways could scientific organisations and scientists intensify their activities for the maintenance of peace?

The members present noted with satisfaction that a symposium on the above mentioned subject could be organised in connection with the thirty-seventh Annual Meeting of the Indian Science Congress and suggested that the synopsises of the papers received for the symposium should be published in Part IV of the Proceedings of the Indian Science Congress. The Convener further reported that there was a lively discussion on the points brought-out in the papers of Mr. S. C. Majumdar and Dr. B. C. Guha (at the Symposium), in which Mr. Trone (of U.S.A.), Mr. Ghosh (of Bangalore),

Mr. K. B. Roy (of Calcutta), and Dr. Malhotra (President of the Section on Engineering and Metallurgy), participated.

It was further resolved that the views of the Sub-Committee in regard to the two questions raised by the Committee on Science and its Social Relations instituted by the International Council of Scientific Unions be placed before the Executive Committee for transmission to the authorities concerned at Paris.

4. During the year (1949) the Government of India, Department of Scientific Research, acting on the advice of the Advisory Committee for Co-ordinating Scientific Work, had requested Prof. J. M. Sen to prepare a report concerning introduction of a course on Science and its Social Relations in the Universities of India, in consultation with Prof. J. D. Bernal. Advantage was taken by Prof. Sen to consult Prof. Bernal when he came to Poona to attend the opening ceremony of the 37th Session of the Indian Science Congress. The report which Prof. J. M. Sen has drawn up and will soon be submitted by him to the Government of India is now given as Appendix to the Annual Report.

5. The subject for the next year's symposium to be held in January 1951, was decided to be left to the Sub-Committee.

6. The Sub-Committee recommended to the Executive Committee that the following members do constitute the Sub-Committee on Science and its Social Relations for the ensuing twelve months (viz February 1950 to January 1951).

(1) General President of the Indian Science Congress Association;

(2 & 3) General Secretaries (Ex-officio);

(4) Treasurer (Ex-officio);

(5 to 17) Presidents of the 13 sections of the 38th Session of the Indian Science Congress (Ex-officio);

(18) Dr. S. P. Agharkar (Poona);
(19) Dr. K. N. Bagchi (Calcutta);
(20) Prof. H. J. Bhabha (Bombay);
(21) Prof. S. N. Bose (Calcutta);
(22) Mr. Nirmal Kumar Bose (Calcutta);
(23) Dr. J. Coates (Delhi);
(24) Dr. Gilbert J. Fowler (Bangalore);
(25) Dr. B. C. Guha (Damodar Valley);
(26) Dr. C. Von F. Haimendorf (Hyderabad);
(27) Prof. D. D. Kanga (Madras);
(28) Mrs. I. Karve (Poona);
(29) Dr. H. K. Mitra (Jamshedpur);
(30) Dr. C. G. Pandit (Delhi);
(31) Mr. Pitambar Pant (Delhi);
(32) Prof. M. N. Saha (Calcutta);
(33) Dr. A. C. Ukil (Calcutta);
(34) Dr. D. N. Wadia (Delhi);
(35) Prof. J. M. Sen (Calcutta).

It was further resolved that Prof. J. M. Sen be elected Convener of the Sub-Committee. With a vote of thanks to the Chair the meeting terminated.

J. M. Sen
Convener

ANNUAL REPORT OF THE SUB-COMMITTEE ON SCIENCE & ITS SOCIAL RELATION FOR THE YEAR 1949.

The annual meeting of the Sub-Committe was held at Allahabad on Monday the 3rd January 1949 at 9 A.M. and a Symposium on Application of Science in India for Social Welfare was held on the 5th January 1949, at 2 P.M. at the Vizianagram Hall. Sir K. S. Krishnan presided and Sir J. C. Ghosh, Sir S. S. Bhatnagar, Dr. J. N. Mukherjee, Dr. H. K. Mitra, Dr. A. C. Ukil, Dr. B. B. Sarkar and Prof. A. C. Banerji spoke on the various aspects of Application of Science for Social Welfare in India. Dr. D. N. Wadia, Dr. W. D. West and Dr. M. S. Krishnan contributed to the Symposium by sending abstracts of their papers dealing with Natural Resources in India in relation to Social Welfare. Prof. M. N. Saha also contributed a paper on University Organisation in relation to Science and Social Welfare. The synopsises of the papers received for the Symposium have been published in Part IV of the Proceedings of the 36th Session of the Indian Science Congress.

During March to August, 1949, the minutes of the meeting of the Sub-Committee held at Allahabad on the 3rd January, 1949, the Annual Report for 1948 and certain papers regarding the activities of the Sub-Committee were forwarded to the members of the Sub-Committee and they were asked to give their views on the two questions raised by the Committee on Science and its Social Relations instituted by the International Council of Scientific Unions, *viz.*,

(1) In which measure do the methods of international scientific works contribute to the creation of an international spirit and to the maintenance of peace?

(2) In which ways could scientific organisations and scientists intensify their activities for the maintenance of peace?

The opinions of the members were summarized by the Convener and were carefully considered at a meeting of the Sub-Committee held on the 14th September 1949, at the Office of the Indian Science Congress, at 1, Park Street, Calcutta. The views of the Sub-Committee as a whole were then recorded as follows and communicated to the Executive Committee of the Indian Science Congress Association. They were also forwarded to all the members of the Sub-Committee who could not attend the meeting held at Calcutta.

Q. 1. In which measure do the methods of international Scientific works contribute to the creation of an international spirit and to the maintenance of peace?

Views of the Sub-Committee

(i) All genuine scientific work tends to create international spirit and helps in the maintenance of peace. It is only when military strategy on the employment of science to purely military ends requiring extreme secrecy is demanded from science that international amity is endangered. This being the case no new methods of international scientific work can help, save by the removal of these new factors. Restoration of free and unfettered exchange of information should be the aim of all scientists.

(ii) Anyone whose reading of scientific literature leads him to consult the results of work in other countries must realise that the fundamental methods of scientific thought are common ground to all nations. There may be something of a national type in the genius of intuitional perception of a possible line of solution to a problem, but the methods of scientific demonstration and verification of a solution are of necessity the same the whole world over.

(iii) Anyone who realises this fact, even from reading (in original or in translation) the work of scientists in other countries is brought to a fuller appreciation of what

he has in common with men of other nations, and this must certainly contribute towards conflict which arises primarily from fear of the unknown. When a scientific worker has occasion not merely to read the work of a foreign scientist, but so to exchange views with him as a colleague, there is a greatly increased probability of his appreciating the extent to which co-operation between individuals may be quite irrespective of nationality, and this attitude—which enters at the emotional level—cannot but help to contribute towards the maintenance of peace.

(iv) The general probability is that such benefits will be most fully forthcoming in the sphere of fundamental or abstract scientific work, where the issue will not be clouded by secondary considerations of how the application of the knowledge might put one or the other nation at a relative advantage. There are, nevertheless, many fields of applied science where disadvantages do not come into the question—notably such sciences as tend to raise general standard to be fruitful in promoting a fellow-feeling and a realisation of the benefits to be derived from the maximum development of international co-operation.

(v) If international laboratories are established in different parts of the world, it will go a long way in establishing closer relationship between workers of different nationalities and thereby creating an international spirit which will help in the maintenance of peace.

(vi) Meeting of international bodies should be held in rotation in different parts of the world thereby affording opportunities of closer contact between workers of different nationalities.

Q. 2. In which ways could scientific organisations and scientists intensify their activities for the maintenance of peace?

VIEWS OF THE SUB-COMMITTEE

(i) Scientific organisations and individual scientists have hardly any voice in the political and military set-up of nations. The scientists are merely used as tools for furthering ends of politicians and military strategists.

(ii) There would seem to be three main lines along which science could hope to work positively towards the maintenance of peace, viz.,

(*a*) To demonstrate the benefits obtainable from a general continuance of peace; or, complementary to this, to demonstrate the overall loss that inevitably results from war.

(*b*) To encourage the spread of scientific methods of thought in matters—particularly political matters—in which frequently emotion rather than reason plays a major part; so that policies may be founded upon facts and scientific principles as far as these can be ascertained, with emotion entering as the necessary inspiration towards effort rather than as a controlling urge blind to unpalateable facts.

(*c*) To find out the fundamental causes which lead nations to come to war as a solution of their problems, rather than solving them by other means; and to find whether there is any means of influencing these factors in a direction more favourable for peace. This is a matter on which psychology should eventually be able to give some guidance.

(iii) One of the causes of war appears to be a struggle for control of raw materials available in different parts of this world. Scientific organisations and scientists by their methods of investigations can find substitutes for raw materials which are

now available only in a particular foreign country or can create good products from low grade materials which are available in the country, and thereby remove one of the causes of war.

(iv) There should be central organisations like the Rome Institute of Agriculture where literature of different countries on different subjects is summarized, and useful notes are prepared for circulation to different parts of the world. The staff of such a Central Institute should have representatives of different countries. The Central Institute should offer scholarships for studies in different subjects in different institutes of the world to students of all nationalities.

During the year 1949, the question on "Food and World Population" was further discussed by various scientific organisations all over India. This question was at first raised on a scientific level by the Sub-Committee on Science and its Social Relations by organising a Symposium under the leadership of Dr. B. C. Guha at Patna in January 1948. Dr. Gilbert Fowler of Bangalore made a special reference to this question in an article on "Saving the Land" while reviewing two books, viz. 'Our Plundered Planet' by F. Osborn and 'Road to Survival' by William Vogt in the daily paper, the Hindu (Madras) dated the June 26, 1949, and concluded by saying: 'If with all the resources of modern science we find ourselves unable to avert world famine we shall all be to blame'.

At the meeting of the Sub-Committee on Science and its Social Relations, held on the 14th September, 1949, it was decided to hold a Symposium on "Engineering Developments in India in relation to Social Welfare" in connection with the 37th Annual Meeting of the Indian Science Congress to be held at Poona in January 1950. The Sub-Committee of the Indian Science Congress approved of the proposal and later on fixed the 3rd of January 1950, as the date for holding the Symposium. Prof. M. S. Thacker, Mr. S. C. Majumdar, Dr. B. C. Guha and Mr. J. B. Auden have agreed to speak on the various aspects of the subject.

We were grieved to learn that Prof. Benoy Kumar Sarkar of the University of Calcutta, who had been an active member of the Sub-Committee for several years, passed away suddenly in U.S.A. in November 1949. His place on the Sub-Committee has remained unfilled. The vacancy may be filled up at the Annual Meeting of the Sub-Committee to be held at Poona on the 3rd January 1950.

All expenses in connection with the meetings of the Sub-Committee are met by the general office of the Indian Science Congress Association. Hence no separate account of such expenses has been maintained. They are included in the general accounts of the Indian Science Congress Association.

J. M. Sen
Convener.

A REPORT CONCERNING INTRODUCTION OF A COURSE ON SCIENCE AND ITS SOCIAL RELATIONS IN THE UNIVERSITIES OF INDIA.

BY

J. M. SEN.

SECTION I—WHY A COURSE ON THE SUBJECT IS NECESSARY

In his Rushton Lectures on "Education and World Tragedy" Dean Howard Jones has tried to show how far the present system of education has created the terrible problems of our time, viz. war, technology in preparation for war and nationalism, in almost all countries of world. He says that retaining the moral idealism of western civilization as a standard of measurement, if any human being tries to discover what has happened to mankind in the last fifty years such a person would be overwhelmed by a single tragic conviction; namely that the history of mankind for the last half century has been a history of deepening horror. The first half of the twentieth century is nearly over. And what do we find? Since 1899, the earth has scarely known a year without warfare, armed revolt, massacre, pogrom or other ingenious form of slaughter. These fifty years include two infernal conflicts—World War I and World War II. They include such disastrous struggles as the Boer War of 1899-1902, the Russo-Japanese War of 1904-05, the two Balkan Wars of 1912-13, the innumerable wars, revolts, 'interventions' and massacres in Finland, the Caucasus, the Ukraine, Poland, Hungary, Manchuria, Siberia, and other border areas, which followed the Bolshevik Revolution of 1917. They include the long drawn out agony of China, which beginning with the massacre of garrison troops in 1917, continues even to this hour. They include the intermittent civil war in Spain. These are the major events.

But there are the other episodes, tragic in their time, viz. the Cretan massacre during the last two years of the nineteenth century (1899-1900), when the Christians slaughtered the Moslem peasantry; the Boxer rebellion of 1900; the Phillipine insurrection and the 'water-cure'; the massacre of a million Armenians between 1899 and 1919. The year 1922 saw the Irish Civil War in full swing, and there were Black and Tan outrages. The year opened with the slaughter of Greek civilians in Samsun—more than one hundred thousand Greeks had been killed and the climax of 1922 was reached at the taking of Smyrna, when an estimated 200,000 Christians were rendered homeless and the city was given over to pillage, rapine, massacre and fire. There was an earlier Graeco-Turkish war in 1897-98, and an Italo-Turkish war in 1911. Between 1928 and 1935, Bolivia and Paraguay fought to exhaustion over the possession of a tropical jungle. Indeed, during most of these fifty years there have been rebellions in Latin America.

The half century has seen armed rebellion sweep through such famous capitals as Paris, Berlin, Madrid, Athens and Rome. It has seen more or less protracted revolutionary struggles in Russia, Mexico, Spain, France, Germany, Hungary, Austria, Greece, Egypt, Iran, Palestine and other Arabian States, Mongolia, China, and various other countries, besides what uncounted minor uprisings—in Nicaragua, Haiti, Albania, Thailand and the like—only the World Almanac tells us. India has experienced a full blast of atrocities in Calcutta and Noakhali in 1946, throughout the Punjab in 1947, and in Kashmir in 1948. Ours is a sick age.

How many human beings have been killed directly or indirectly in the course of this terrible history? It is almost impossible to find out. For example, we do not know and probably shall never know how many hundreds of thousands have died of violence in Asia and Africa during the fifty years. How many perished during the obscure struggle for the control of Tannu-Tuwa, a country as big as Great Britain, lying between Mongolia and Siberia? How many Koreans were slaughtered by their

Japanese overlords? How many natives of Congo died during the struggle for the control of the Belgian Congo? We do not know how many hundreds of thousands died in Russia, or in neighbouring states during the terrible convulsions that swept over the future Soviet Union between 1914 and the adoption of the constitution of 1925. We do not know how many millions Hitler and his agents killed. But what we know with rough accuracy is sufficiently appalling.

Before 1900, about 25 percent of all battle casualties died; in World War I this increased to 33 1|3 percent. Out of every thousand Europeans alive in the twelfth century it is thought that two died as battle casualties; in the first twenty-five years of the twentieth century 54 out of every thousand so died. Professor Pitirim Sorokin estimates that during the first third of the twentieth century Europe alone suffered 24 million war casualties. From the eleventh century to the end of the nineteenth century war casualties totalled about 18 million. Therefore in the first three decades of the present century 33 1|3 percent more human beings were killed in war in Europe than were killed in the previous 800 years. These figures do not include four other continents and they take us only to the rise of Hitler. Influenza, typhus, starvation, and other destroying agencies killed millions more. It has been estimated that 40 million of world population died, directly or indirectly, in World War I. We do not yet know the figures for World War II. The Japanese dead alone are reckoned at more than three million. The science reporter of the New York Times was thought in 1945, to have written a singularly effective masterpiece about the rare beauty of the atomic bomb upheaval over Hiroshima. This killed or mutilated 150,000 human beings, 30,000 so completely that no trace of them remains. A United Press dispatch from the Vatican in November 1945, estimated the dead, military and civilian, in World War II at over 22 million, and the wounded at 34 million, *i.e.* 56 million casualties in all.

While this blind struggle continues it increases its ferocity. Through the mouth of Satan in *The Mysterious Stranger,* Mark Twain sardonically remarks, "No brute ever does a cruel thing—that is the monopoly of those with the Moral Sense." Millions (nearly 100 million) who died, directly or indirectly in the two World Wars are at peace. Unnumbered thousands of human beings whose lives have been wrecked by war or starvation or despair or disease still exist. Regarding the long range results of war upon our lives Professor Quincy Wright tells us:—"Closely related to the racial (*i.e.* human) cost of war but less susceptible to objective measurement are the social and cultural costs of war in the deterioration of standards. Wars of large magnitude have been followed by anti-intellectual movements in art, literature and philosophy; by waves of crime, sexual license, suicide, venereal disease, delinquent youth; by class, racial and religious intolerance; by persecution, refugees, social and political revolution; by abandonment of orderly processes for settling disputes and changing law; and by a decline in respect for international law and treatises." The standards of only a few, he says, are elevated by war, a minor gain which by contrast deepens the gloom of the general picture. The coarsening effects upon our finer sensibilities of an uninterrupted series of wars, revolutions and bloodsheds have been such that people merely read them as ordinary news in the newspapers and then turn to the sports pages. So deep have we descended into the pit of insensibility that Dr. Irving Langmuir, Nobel Prize winner, physical chemist and associate Director of the General Electric Research Laboratories, solemnly warned a joint meeting of the American Philosophical Society and the National Academy of Sciences in the autumn of 1945 in Philadelphia that "so-called atomic warfare, unless the release of nuclear energy is controlled by the world, may make the entire earth uninhabitable wiping out the ignoble race of men." Dr. Langmuir is a conservative scientist. He spoke sadly and seriously. But the Americans do not believe things like this because they, and possibly people all over the world, do not wish to believe them.

Dr. Langmuir's statement suggests a second basic fact in this brutal history. It is that *modern warfare is increasingly a function of education,* and education is

increasingly dominated by war. We do not like to think that this is so. We try desperately to deceive ourselves. One form of optimistic rationalization is the "progress" fallacy. The progress fallacy assumes that mankind always survives any conceivable weapon. Another fact to be observed in this strange, eventful history is to note how nationalism increasingly invades education. The eighteenth century was perhaps the last period when a truly international culture was the common object of study, at least among the cultivated classes in the western world. Till then education was not customarily created or paid for by the state. Throughout the nineteenth century, and increasingly in the twentieth, the doctrine that education is a proper charge against the public purse has meant that the state, in greater and greater degree, has made education the instrument of its own support. The nationalism which this type of education has created has in its turn created an age in which instruments of communication have prematurely thrown cultures into collision with each other before the people were ready to understand one another. This nationalism, which has rallied religion, culture, technology and science itself to its support, now includes education—and it is a necessary part of something called 'national defense.' War, technology in preparation for war, and nationlism—these are three great forces warping the healthy development of education in what we call the civilized world. The problems they raise are deeper and darker than those polite fictions discussed in most educational meetings.

Face to face with the spectre of war, with technology controlled by war, and with an intense and irrational nationalism which, as in the case of atom bomb, dreams of going to war before some other nation shall invent an even more terrible weapon—and this, in a world in which the nations have solemnly pledged themselves to unite for peace—what have the scientists to offer for the guiding of mankind? Our problem is then deeper, more radical, and alas more nearly insoluble than a simple balancing of general gains in health, longevity, good will and control of nature against the stupendous losses of war.

Lord Bertrand Russel, the great English philosopher, in discussing the possibilities of the second half of the twentieth century, which he warns, may bring appalling disasters, says that "dislike of the Soviet system while it justifies us in resisting its forcible extension, does not justify us in going to war to change it where it exists. Our policy must not be that of crusaders, but of nations engaged in collective self-defence. And not merely self-defence, but defence of a way of life that we value. War, even if it were quickly successful, would damage this way of life; we should, when it was over, be less civilized, less humane, less capable of democracy, and less able to carry on the work of art and literature. War for civilization may sometimes be necessary, but civilization is not as good after a serious war as it was before. As guardians of certain things that we value, it is, therefore as much our duty to preserve peace if we can as it is to fight if we must."

SECTION II—SOCIAL PROBLEMS OF MODERN CIVILIZATION

Professor Elton Mayo in his book, *The Social Problems of an Industrial Civilization,* writes:—Technical skill manifests itself as a capacity to manipulate things in the service of human purposes. Social skill shows itself as a capacity to receive communications from others and to respond to the attitudes and ideas of others in such fashion as to promote congenial participation in a common task. In these days, education has gone over—often extravagantly—to the development of technical skills and the appropriate scientific bases for such skills. This would be excellent were it not for the fact that the universities have failed to develop an equivalent study of and instruction in social skill. We have in fact passed beyond that stage of human organization in which effective communication and collaboration were secured by established routines of relationship.

AGAIN:

We have undertaken to transform an economy of scarcity into an economy of abundance, and the technicians are showing us the way. We are committed to the development of a high human adaptabiility that has not charaterized any known human society in the past, and it is our present failure in this respect that finds reflection in the social chaos which is destroying civilised society.

AND AGAIN:

Under the influence of economic theory, we have a system of education that trains youngmen in technical understanding and technical skill: we do nothing whatever to develop social insight or to impart social skill. Indeed we provide an education that operates to hinder the development of such skills. And the general public, business leaders, and politicians are left with the implication that mankind is an unorganized rabble upon which order must be imposed. It was this delusion that encouraged Hitler's dreams of grandeur.

FINALLY:

We have failed to train students in the study of social situation; we have thought that first-class technical training was sufficient in a modern and mechanical age. As a consequent we may be sometimes technically competent, but we combine this with utter social incompetence. This defect of education and administration has of recent years become a menace to the whole future of civilization.

Professor Northrop also emphasizes the above opinion of Professor Mayo in his book, *The Meeting of East and West,* and says that the present civilization must re-educate itself or perish. The creation in the United Nations pattern of UNESCO—the United Nations Educational Scientific and Cultural Organisation—is a crowning example of world-wide interest in the inter-relations between war, technological training for war and nationalism on the one hand, and education on the other. Education is, then a world-wide problem. The catastrophes of the last half century have affected some parts of educational system in different parts of the world. Nevertheless, it is roughly true that primary education in most countries particularly in India has not been violently altered. Our sociological theories, our political economy, and our doctrines of education are derived from an unbroken tradition of the country. The whole of this tradition is wrapped by the vicious assumption that each generation will substantially live amid the conditions governing the lives of the fathers and will transmit those conditions to mould with equal force the lives of its children. For the first time we are beginning to realize that we are living in a period of human history for which this assumption is false. To express doubt concerning the timeless validity of tradition may shock the academic mind in India but it is nevertheless true that unless a re-orientation takes place in the traditional ideas of education there will be a disaster in the second half of the twentieth century both in social and political life of the country. The troubles lie, not with the tradition, but with human beings who will not live in the glory and wisdom of the tradition. Therefore the tradition must be re-taught. An attempt towards this direction is now being made by the Government of India, Ministry of Education, by inviting the attention of the public to a pamphlet on Basic and Social Education which seeks to provide a short account of what has been and is proposed to be done in the immediate future (vide Pamphlet No. 58 of the Bureau of Education published in 1949).

The discovery of murderous potentialities in nuclear energy and the invention of many death-dealing machines require that education in India must somehow take account of events in a world in which the U.S.A. and Soviet Russia have become dominant powers. The whole of Asia is violently disturbed and man's uneasiness about his traditional values has spread from a few troubled spirits at the top of the social

pyramid down among the mass of mankind everywhere. Merely to reaffirm past values by a return upon dead sages will not quite do. What we need is an educational programme that will face the present with courage and interest. One difficulty with educational programmes is that they are never built for time but are always built for eternity. Each pedagogical reformer, convinced that he has found at last a changeless and enduring way of educating human nature, announces his programme as a series of timeless absolutes. Every curriculum has an air of being built upon the impregnable rock of holy scripture; and, since academic institutions are highly conservative, the new curriculum, once alive and vital, when it becomes moribund, either changes slowly or changes not at all.

SECTION III—THE EDUCATIONAL PROGRAMME

It is not necessary to launch another educational reform. What is needed is a reorientation of scientific studies in colleges. The suggestions are not absolute and for all time. The colleges in India ought now to introduce a fairly comprehensive course in *Social Function of Science.*

This course should include—

(*a*) A study of the theory of science and of the application of scientific discoveries to technology.

(*b*) A study of the assumptions and workings of representative governments.

(*c*) A study of the personal relationships in modern society.

Regarding item (*a*), it may be said that professional, vocational, technical or technological training is unavoidable in a fiercely competitive democracy. The problem is not to deny its necessity but to control and guide its force. The problem is to bring our social engineering up to the maturity of our technological engineering. A course in 'General Science', a course in the history of science, a course in the postulates of the scientific method will merely increase our technological confusion unless it is joined to something else. That something else is the study of what happens to scientific discoveries when they are practically put to work in our industrial culture. Economist and sociologist, psychologist and anthropologist must join the scientist and point out that when science invents the internal combustion engine, vast economic and sociological forces are set to work. It is insufficient to praise research for its own sake. The tremendous (and sometimes tragic) results of research for its own sake, when these results take the form of widespread technological change in modern society, are as basic to an understanding of the modern world as any part of scientific theory. The creation of instructional units of this sort will be a matter of great difficulty, but to keep scientific theory in one compartment and economic and social studies of a technological culture in another compartment is precisely the tragic error of our education and of our culture.

Regarding item (*b*)—a study of the assumptions and working of representative governments—it can be said that if the world during the next few years is going to be split, as it threatens to be, between the communistic and the democratic theories of the state, surely our common studies should be far more realistically focussed upon the workings of the principal democratic states of the world. The same logic makes the study of Soviet Russia—its culture, its government, its economic structure, the character and the desires of its myriad peoples—of paramount importance. If Soviet Russia is to become the chief enemy of the democracies we ought to comprehend her; if she is to become the friend and aider of the democracies, all the more reason for widest spread of sympathetic information about the Soviet Russian Empire. In the next quarter of a century this empire is going to be of far greater importance to modern man than the empires of the Caesars or of Charlemagne or of Napolean, now commonly

studied in the schools and colleges. Of course it would take a certain amount of courage on the part of the scientific departments and educational authorities in India to advocate a sympathetic approach to the Soviet Russian problem.

Regarding item (*c*)—a study of personal relationships in modern society—it may be said that this is not a subject whose elements can be so specific as the elements of general education previously suggested. Still the need of restoring confidence in the relations between man and man is supreme. Perhaps, in a fiercely competitive society, confidence in these relations cannot be wholly restored but the present corruption of these relations can certainly be checked and the conditions improved. To repeat Professor Mayo's words: "We have passed beyond that stage of human organization in which effective communication and collaboration were secured by established routines of relationship." Professor Mayo rightly charges the present governments with "utter social incompetence." *But the beginning of social competence is the trust of man in man;* and a wider understanding of the psychology of personal relationships seems to scientists a more desperate need in our education than polite courses in literature, philosophy and the fine arts.

SECTION IV—CHARTER FOR SCIENTISTS

A combination of all three aspects mentioned above will necssarily create a demand for laying down certain principles of a Charter for Scientists. And this was exactly what the Committee on Science and its Social Relations instituted by the International Council of Scientific Unions at its meeting held at the UNESCO House, Paris, did on the 15th and 16th June 1948. The principles of a Charter for Scientists which the Committee has drawn up can be summarised in the following sentences:—

The prominent position held at present by science in society, and the rapid transformation of the world through the application of science, carry with them for scientific workers special obligations over and above the ordinary duties of citizenship. Besides this the scientific worker has special responsibilities since he or she has the possibility of obtaining information not readily available to the average citizen. It thus becomes the duty of the scientist to:

(*a*) maintain a spirit of frankness, honesty, integrity and co-operation, and to work for international understanding;
(*b*) consciously examine the measuring and purposes of the work that he or she is performing;
(*c*) when in the service of others enquire into the purpose for which the work is being done and the moral issues that may be involved;
(*d*) promote the development of science in the way most beneficial to mankind and exert his or her influence as far as possible to prevent its misuse;
(*e*) assist in the education of the people and the Government in the purposes and achievements of science.

In order to fulfil these obligations it is necessary to claim certain rights for scientists, the principal ones of which are:

(*i*) freedom of publications and the utmost freedom to discuss one's work with other scientists;
(*ii*) economic security and the right to participate freely in all activities permitted to all citizens; and
(*iii*) the possibility of obtaining information about the purposes for which his or her work is being done.

The committee on Science and its Social Relations instituted by the International Council of Scientific Unions has also raised the question of giving attention to *man* himself as the fundamental unit of society and therefore has asked everybody to consider three principal aspects of social relations of science, viz:—

(*i*) the scientist before society;
(*ii*) changes introduced in human societies through the technological development of science;
(*iii*) the antagonism between biological order and social order.

In the world generally the fall of the Fascist States has left a kind vacuum in beliefs, which must be filled; and if the democratic state has not the dynamic energy to draw to itself the affirmative allegiance of the younger generation in India then the democratic state will not have a healthy growth. The case is not simple 'patriotism'. The task of education is, along with other institutions of the state, to furnish this dynamic. But it must be an intelligent dynamic. Hence it must deal with the individuals as units of the society. Dr. Rajendra Prasad, President of the Indian Constituent Assembly, recently stated at Wardha that "we must cencentrate on the individual, on whom depends the solution of many problems confronting the work; it is individuals who constitute a nation. We have to reform the individual, make him really an instrument of peace so that he may influence other individuals around him. He may influence his Government. Matatma Gandhi tried to mould the individual throughout his activities in Africa and in India; it was individuals whom he moulded and he hoped that in that way he would be able to create a society of men in the light of his teachings. We have to take decisions which will help individuals, and which will help us all individually to create that kind of society which will banish war".

Professor Bernal just before the World War II emphasized the same aspect from the stand point of a scientist. He stated—"we have in the practice of science the prototype for all human common action. The task which the scientists have undertaken—the understanding and control of nature and of *man himself*—is merely the conscious expression of the task of human society. The methods by which this task is attempted, however inperfectly they are realized, are the methods by which humanity is most likely to secure its own future. *In its endeavour science is communism.* In science men have learned consciously to subordinate themselves to a common purpose without losing the individuality of their achievements. Each one knows that his work depends on that of his predecessors and colleagues, and that it can only reach its fruition through the work of his successors. In science men collaborate not because they are forced to by superior authority or because they blindly follow some chosen leader, but because they realize that only in this willing collaboration can each man find his goal. Not orders, but advice, determines action. Each man knows that only by advice, honestly and disinterestedly given, can his work succeed, because such advice expresses as near as may be the inexorable logic of the material world, viz stubborn facts. Facts cannot be forced to our desires, and freedom comes by admitting this necessity and not by pretending to ignore it. These are things that have been learned painfully and incompletely in the pursuit of science. Only in the wider tasks of humanity will their full use be found."

The desirability of introducing the subject of "Science and its Social Relations" in the universities of India has been recognised by the Advisory Committee for Co-ordinating Scientific work of the Government of India, of which the Prime Minister Pandit Jawharlal Nehrū is the Chairman. The Prime Minister is most anxious that the students in the Universities and technological colleages in India should know how through the instrumentality of science the political and social conditions of India are rapidly changing. The application of natural sciences for social welfare, the utilization of natural resources for social welfare, the application of biological sciences for social welfare, the engineering developments for social welfare, the social problems of an industrial civilization, are merely some of the vast number of topics which require careful attention of the faculties of science, technology, commerce and education of the universities in India.

SECTION V—THE SYLLABUS OF STUDIES

Professor J. D. Bernal in his well known book "The Social Function of Science" has made a critical examination of the function of science in society. He narrates what science does and mentions what science could do. In the preface to his book, he says:—"It used to be believed that the results of scientific investigation would lead to continue progressive improvements in conditions of life; but the war and then economic crises have shown that science can be used as easily for destructive and wasteful purposes, and voices have been raised demanding the cessation of scientific research as the only means of preserving a tolerable civilization. Scientists themselves, faced with these criticisms, have been forced to consider effectively for the first time how the work they are doing is connected with the social and economic development which are occurring around them.....To begin with, it is necessary to consider the social function of science not absolutely, but as something which has grown up imperceptibly with the growth of science. Science has ceased to be the occupation of curious gentlemen or of ingenious minds supported by wealthy patrons, and has become an industry supported by large industrial monopolies and by the State. Imperceptibly this has altered the character of science from an individual to a collective basis, and has enhanced the importance of apparatus and administration. But as these developments have proceeded in an uncordinated and haphazard manner, the result at the present day is a structure of appalling inefficiency both as to its internal organisation and as to the means of application on problems of production or of welfare.....The application of science furnishes other problems. Here the tendency in the past has been almost exclusively that of directing science towards improvements in material production primarily through lowering the cost and towards the development of the instruments of war. This has lead to an almost complete neglect of those applications which would be of more immediate value to human welfare, in particular to health and domestic life. The result has been an extraordinary disproportion in the development of different sciences, the biological and still more the sociological sciences having been starved at the expense of the more immediately profitable physical and chemical sciences.....Any discussion of the application of science necessarily involved questions of economics, and we are driven to enquire how far the various economic systems now existing or proposed can give the opportunity for the maximum application of science for human welfare. Further economics cannot be separated from politics..... The universal preparations for a more general and terrible war have affected scientists not only as citizens, but also through their work. Science itself seems in danger. The scientist has begun to realize his social responsibility but if science is to fulfil the function which its tradition demands, and to avoid the dangers which threaten it, we require an increased appreciation, both on the part of scientists and of the general public, of the intricate relations between science and contemporary life."

It is therefore suggested that the following topics from Professor Bernal's book might be prescribed as a Syllabus for the course on science and its social relations in the universities in India:—

PART I.

(1) The interaction of science and society.
(2) Science, Learning and Craft.
(3) The Birth of Modern Science.
(4) Science and Manufacture.
(5) Science and Imperial Expansion.
(6) Science and Socialism.
(7) Science Teaching in the Past
(8) Science in Schools.
(9) Science in the Universities.

(10) The Training of Research Worker.
(11) Popular Science.
(12) Three aims for science—psychological, rational and social.
(13) The Ideal of Pure Science: Science as escape; Science and cynicism.
(14) The Technical Inefficiency of Science; Bad Organisation; Laboratory waste of skill; false economies; salaries of Scientific Workers.
(15) Research in Industry: Secrecy; lack of freedom; Low Standard.
(16) Lack of Co-ordination of Research.
(17) The effect of inefficient organisation.
(18) The Interaction of Science and Technology.
(19) The Profitability of Science.
(20) Industrial Competition and Research.
(21) Monopoly and Research.
(22) The Stifling of Research: Patents.
(23) Co-operative Industrial Research.
(24) Economic Nationalism and Research.
(25) The Distortion of Industrial Research.
(26) Science and Human Welfare.
(27) Science and War.
(28) War Research Today.
(29) Science and Armaments.
(30) National Food Supplies.
(31) The diversion of Research to War Uses.
(32) The Scientist faces the Problem of War.
(33) International Science today.
(34) The Problem of Language.
(35) The Scientific World and its Divisions.
(36) Science in the Older Industrial Countries.
(37) Science in the United States.
(38) Science in the East.
(39) Science and Fascism.
(40) Science and Socialism.

PART II.

(1) The Reorganisation of Science.
(2) Changing the teaching of science in schools and in universities.
(3) Revising the curriculum.
(4) Reorganisation of Research.
(5) Scientific Communication:—the function of scientific publications; the international problem: popular science.
(6) The Finance of Science.
(7) The Strategy of Scientific Advance: Can science be planned? A Survey of Science; the prospects of Science; Physics, Chemistry, Biology; Social Science and Psychology: The Future of Science.
(8) Science in the Service of Man. Human Needs—psychological and social—Food; Clothing; Housing; Health; Work; Play and Recreation; Production; Mining; Power Production; Engineering; Chemical Industry; Transport; Distribution; Communication: Administration and Control; General Effects of Science; Science and Society.
(9) Science and Social Transformation. Social Conditions and Science. How Science changes Society? The Scientific Worker of Today. The Scientist as Citizen. Social Consciousness. Organisation of Scientists. Science and Politics.

(10) The Social Function of Science. The Major Transformation of History; Society and Civilization; The Scientific Revolution; The Role of Capitalism; The Social implications of Science; The Tasks of Science in the transition period; Preventible evils; Discovery and satisfaction of needs. Science and Culture.

In the proposed syllabus outlined above, there is no mention of the organization of research in Britain. Professor Bernal in his book has devoted a full chapter on the Existing Organisation of Scientific Research in Britain. What however should be included in the syllabus must have reference to the following topics, viz—

Part III.

(1) University, Government and Industrial Projects and Research in India and National Laboratories.
(2) Scientific Societies in India and Scientific Publications in India.
(3) Research in the Universities of India.
(4) Governmental Scientific Research in India.
(5) Medical Research in India.
(6) Public Health Research in India.
(7) Agricultural Research in India.
(8) Science in Industry in India.
(9) Finance of Research in India.
(10) The Budget of Science in India.

For topics mentioned in Parts I and II of the syllabus Professor Bernal's book may be prescribed as a text book. It is a comprehensive treatise and is undoubtedly the best book on the subject. For supplementary readings small treatises like New Scientific Achievements by G. S. Ranshaw (Burke Publishing Company), Science News Nos. I & 2 and Science in Peace (these three being Penguin Books), and books on General Science may be prescribed.

For topics mentioned in Part III it is recommended that the Department of Scientific Research, Government of India, should undertake compilation and publication of a volume dealing with not only all the items mentioned therein but also such other useful scientific information as the Department might think suitable for inclusion in it.

In a discussion with Professor Bernal in January 1950, when he visited India in connection with the meeting of the Indian Science Congress Association, it was felt that he thought that some of the topics mentioned in part II might be too ambitious for study in India, more so after the Second World War, unless they are studied for the purpose of obtaining a historical background of the modern social problems in relation to science. For this reason Professor Bernal suggested that a more careful study of the topics discussed in his recent book 'The Freedom of Necessity' (published in 1949) would be desirable. He emphasized that the following topics, if carefilly studied, would give a new outlook to the students of science. They are mentioned below as Part IV of the syllabus.

Part IV.

(1) Man and the World
Belief and Action
The Challenge of our Time
(2) The Relevance of Science
The Effect of Social Forms on Social Science
Transformation in Science
Science and Liberty
Liberty and the Individual.

(3) Science and the Humanities
Science Teaching and General Education

(4) Science and the Arts

(5) Science in Economics and Politics.

(6) The Atomic Age.

Moreover Professor Bernal would like all Engineering students to know the following:—

(1) Economic and Aesthetic Aspects of Engineering.

(2) Social Aspect of Engineering.

(3) General Social History of Science with special reference to food, agriculture and electrical industry of the country.

Discussion groups of scientists and science graduates who will ultimately be teachers of 'Science and its Social Relations' should also be arranged by the Universities in India. Unless study groups are formed it will be difficult to get suitable teachers on the subject from among the teachers of science in colleges. Further it is suggested that each university and every college teaching science subjects even up to the B.Sc. course should make arrangements for teaching some, if not most of the topics included in the course outlined above.

At the end of a fairly comprehensive study of the projects and topics included in the syllabus on 'Science and its Social Relations' the scientists and scientific workers should be able to say in the words of Professor Bernal:—"We have seen science as an integral part both of the material and economic life of our times and of the ideas which guide and inspire it. Science puts into our hands the means of satisfying our material needs. It gives us also ideas which will enable us to understand, to co-ordinate and to satisfy our needs in social sphere. Beyond this science has something as important though less definite to offer; a reasonable hope in the unexplored possibilities of the future, an inspiration which is slowly but surely becoming the dominent driving force of modern thought and action."

Ultimately the scientists and technicians, while enlisting themselves as members of an International Federation should be able to take an oath, in the words of Dr. Weltfish as follows:—

"I pledge myself that I will use my knowledge for the good of humanity against the destructive forces of the world and the ruthless intent of men, and that I will work together with my fellow scientists of whatever nation, creed or colour, for these our common ends."

RESOULTION OF SECTIONAL COMMITTEE
SECTION OF ENGINEERING AND METALLURGY

1. Since planning presumes the conception and detailing of an objective.

2. Since Engineering implies the designing and execution of the objective with full cognizance of available material and human resources.

3. Since the Government of India has initiated and encouraged many multipurpose projects, to conserve our depleting resources and to develope new ones, and to raise the cultural standard of the citizen of India.

4. Since raising the Cultural standard implies the availability of nourishing food, better clothing, adequate housing, improved hygiene and health facilities and universal education for the citizens of India.

5. Since the achievement of the above objectives compels accelarated productivity in agriculture, industry and increased activity in trade.

6. And, since to achieve optimum results integration and co-ordination of the diverse plans are imperative, to give effect to the objectives stated above.

Therefore be it resolved that the Indian Science Congress recommends the immediate establishment of a Federal Planning Commission and to provide the highest financial priority to the various multipurpose projects initiated by the Government of India so far.

SECTION OF PSYCHOLOGY & EDUCATIONAL SCIENCES

1. The Sectional Committee of Psychology & Educational Sciences considered the suggestion of the President for forwarding a Council of Psychological Research for the purposes:

"For this purpose a Council of Psychological Research may be constituted which will meet at least once a year to review research work done by various workers in the field, to offer facilities to them and to coordinate their activities. It will publish a report detailing the main lines of research carried on by psychologists at various centres. In addition, it may undertake some other task such as to (*a*) prepare a dictionary of psychological terms in the national language, (*b*) maintain a list of workers, (*c*) publish research monographs, (*d*) encourage research in the design of apparatus and instruments, (*e*) and to develope contact with psychologists in other countries, try to invite experts and organise special courses and lectures by visiting and exchange professors from abroad and in the country".

2. Resolved that a Committee of the following be constituted to work and submit a report:

1. Dr. N. S. N. Sastry, Bangalore, 2. Principal, T. K. N. Menon, Baroda, 3. Prof. S. K. Bose, Calcutta, 4. Major Davis, Ranchi, 5. Dr. B. L. Atreya, Banares. 6. Prof Kali Prasad, Lucknow.

II RULES AND REGULATIONS

RULES

1. The name of the Association shall be the Indian Science Congress Association and its objects shall be the advancement of Science in India by the annual holding of a Congress and the doing of all such thing as are incidental or conducive to the above object, including—

(*a*) the holding and management of funds and property;
(*b*) the acquisition of rights and privileges necessary or convenient for the object of the Association;

(*c*) the management, development, improvement, disposal and sale of all and any parts of the property of the Association.

2. The Association shall consist of Ordinary Members, Sustaining Members, Benefactors, Honorary Members and Session Members.

3. Ordinary Members of the Association shall have the right to contribute papers for reading at the Session of the Congress, to receive free of charge all publications issued by the Association, and to fill any office in the Association on being duly elected thereto.

4. The annual subscription of Ordinary Members shall be Rs. 12. The subscription shall become due on the 1st February of each year and shall only be effective as payment for Ordinary Membership subscription if received before the 15th July of the year.

5. Any Ordinary Member may compound for the payment of all future annual subscriptions by the payment in a single sum of Rs. 150.

6. Any Ordinary Member agreeing to pay one aditional subscription (Rs. 12) during his period of membership shall be called Sustaining Member.

7. Any person paying a lump sum of Rs. 500 or more or any institution paying a lump sum of Rs. 10,000 or more shall be a Benefactor of the Association, subject to the approval of the Executive Committee. Benefactors shall have all rights and privileges of Ordinary Members during their lifetime.

An institutional Benefactor shall have the right to nominate one person as Ordinary Member of the Association.

8. Honorary Member shall have all the rights and privileges of Ordinary Members, Honorary Members, the number of whom shall be limited to fifteen at any one time, shall be persons eminent for their contributions to science or persons who have rendered conspicuous services to the cause of science in India.

Honorary Members shall be nominated by the Executive Committee subject to confirmation by the Council and the General Committee at its annual meeting. Not more than one Honorary Member shall be elected in any year.

9. There shall be three classes of Session Members:—

(*a*) Full Session Member—subscription Rs. 12 per Session.
(*b*) Associate Session Members—subscription Rs. 5 per Session.
(*c*) Student Session Members—subscription Rs. 2 per Session.

10. Full Session Members shall have the right to contribute papers for reading at the Session of the Congress, and to receive free of charge all publications issued by the Association relating to the Session of the Congress of which they are Members.

Associate and Student Session Members shall have the right to submit papers for reading at the Session of the Congress of which they are Members, provided such papers be communicated through an Ordinary or an Honorary Member of the Association.

A Student Member shall before admission be duly certified by the head of his or her institution to be a *bonafide student*.

Associate and Student Session Members shall receive free of cost the Abstracts of Paper contributed for the Session of which they are members.

11. The official year of the Association shall commence from the 1st of February.

12. There shall be Officers of the Association consisting of the members of the Executive Committee and Presidents and Recorders of Sections.

13. Only Ordinary and Honorary Members shall hold office in the Association.

14. The term of office of all Officers of the Association except the President shall commence from the beginning of the official year and shall extend until the assumption of office by their successors, appointed in accordance with the provisions of these Rules. The President shall assume office on the opening day of the Annual Congress following the one at which he is appointed, and shall continue to hold office until the assumption of office by his successor.

15. There shall be an Executive Committee which shall carry on the administrative work of the Association and submit such questions as it thinks desirable to a General Committee at its Annual Meeting during the Session of the Congress or at a Special Meeting of which due notice shall have been given.

16. The Executive Committee shall consist of the President, the President-elect for the following year, the two General Secretaries, the Treasurer and ten Members, Ordinary or Honorary, elected by the General Committee. For the purpose of this election any Ordinary or Honorary Member may propose the name of an Ordinary or an Honorary Member for election to the Executive Committee. Such proposal must

be seconded by another Ordinary or Honorary Member and must reach the General Secretary before the 15th September. The Executive Committee shall circulate the names, together with such other names, not exceeding three, as it may suggest, to all Ordinary and Honorary Members for election by ballot. The ballot papers will be scrutinized by the President or his nominee and the General Secretaries, and the results of the ballot will be announced at the meeting of the General Committee.

Ordinary or Honorary Members, who have been elected members of the Executive Committee for three successive years, shall not be eligible for election as members for a period of two years after the completion of their term of appointment.

The Executive Committee shall co-opt as member at least one and not more than two Local Secretaries for the ensuing Session of the Congress.

17. The Executive Committee shall have full power to transact all business in cases of emergency, notwithstanding any limitations hereinafter laid down, and to deal with all matters not otherwise provided for in these Rules, including the making of such Regulations as may appear conducive to the good administration of the Association and the attainment of its objects; provided always that such Regulations be not inconsistent with anything contained in these Rules, that they be reported for the information of the next meeting of the General Committee, and that they be subject to rescission or alteration by the Executive Committee or by any meeting of the General Committee.

18. There shall be a General Committee which shall consist of all Ordinary and Honorary Members of the Association.

19. The General Committee shall meet at least once during each Session of the Congress, preferably, in the middle of the Session.

20. There shall be a Council which shall consist of all Members of the Executive Committee, and all such Ordinary and Honorary Members of the Association as have held office as President, General Secretary, Treasurer, or Managing Secretary of the Association, the Sectional Presidents for the ensuing Session, and and in addition seven Members of the Association, Ordinary or Honorary, elected by the General Committee. For the purpose of this election any Ordinary or Honorary Member may propose the name of an Ordinary or an Honorary Member for election to the Council. Such proposal must be seconded by another Ordinary or Honorary Member and must reach the General Secretary before the 15th September. The Executive Committee shall circulate these names, together with such other names, not exceeding three, as it may suggest, to all Ordinary and Honorary Members for election by ballot. The ballot papers will be scrutinized by the President or his nominee and the General Secretaries, and the results of the ballot will be announced at the meeting of the General Committee.

21. The function of the Council shall be to act as a body of advisers to be consulted by the Executive Committee on important questions of policy or scientific import.

2. There shall be a President who shall be nominated by the Executive Committee and whose nomination shall be submitted to the General Committee at its Annual Meeting during the Session of the Congress for confirmation.

23. There shall be two General Secretaries (one of whom shall be resident in Calcutta) who shall be nominated by the Executive Committee and whose nomination shall be submitted to the General Committee at its Annual Meeting during the Session of the Congress for confirmation.

24. There shall be a Treasurer who shall be nominated by the Executive Committee and whose nomination shall be submitted for confirmation to the General Committee at its Annual Meeting during the Session of the Congress.

25. The term of office of each General Secretary and of the Treasurer shall be for a period of three years following the confirmation of the appointment by the General Committee. They shall not be eligible for re-election to the office for a period of three years after the termination of their appointment.

26. In the event of a vacancy amongst the General Secretaries and the Treasurer occurring between two Session of the Congress the Executive Committee shall have power to appoint a General Secretary or the Treasurer for the period up to the termination of the next Session of the Congress.

27. There shall be a Local Secretary or Local Secretaries for each Session of the Congress who shall be appointed by the Executive Committee.

28. There shall be a Local Committee for each Session of the Congress which shall be appointed by the Executive Committee.

29. The Local Secretary, or Secretaries, and the Local Committee shall jointly, on behalf of and in consultation with the Executive Committee, make all necessary arrangements for the holding of the Session of the Congress.

30. For the purpose of scientific deliberations during the Session of the Congress there shall be such Sections corresponding to different branches of science as may from time to time be constituted by the General Committee on the recommendation of the Executive Committee. It shall be competent for any Section after the first day's meeting to hold its scientific meetings in sub-sections for the purpose of dealing separately with different groups of papers submitted to that Section. A separate Chairman may be appointed by the Sectional President in consulation with the Sectional Committee to preside over each sub-section.

31. There shall be in each Section a President and a Recorder, who shall be appointed by the Sectional Committee in accordance with the procedure laid down in Regulation 1(8). Where this procedure has not been followed, those appointments shall be made by the Executive Committee. The appointments shall be placed for confirmation before the General Committee. In addition there shall be Sectional Correspondent and a Local Sectional Secretary, who shall be appointed by the Executive Committee.

32. In each Section there shall be Sectional Officers, namely, a President, a Recorder, a Sectional Correspondent, and a Local Sectional Secretary. The President and the Recorder shall be the chief executive officers of the Section. They shall have power to act on behalf of the Sectional Committee in any matter of urgency which cannot be brought before the Sectional Committee for consideration, and they shall report such action to the Sectional Committee at its next meeting.

The work of each Section shall be conducted by a Sectional Committee which shall be constituted as follows:—

(*a*) Sectional Officers.

(*b*) All Ordinary and Honorary Members of the Association who have been Presidents or Recorders of the Section.

(*c*) Two Members of the Association, Ordinary or Honorary, elected by the General Committee at its Annual Meeting during the Session of the Congress.

The Sectional President shall preside over all meetings of the Section and of the Sectional Committee. He shall be the convener of the meetings of the Sectional Committee. His ruling shall be final on all points of order that may arise.

The Sectional Recorder shall act as the Secretary of the Sectional Committee, and shall maintain a proper record of the proceedings of the Sectional Committee and of the Section in a book provided for the purpose. He shall be responsible for the punctual transmission to the General Secretary of the recommendations adopted by the Sectional Committee, and of resolutions adopted by the Section.

The Sectional Correspondent shall be resident at the headquarters of the Association, and shall be responsible for preparing for the press the material relating to his Section, according to the instructions of the Sectional President.

The Local Sectional Secretary shall be resident in the locality where the Annual Session is held, and shall be responsible for all local arrangements for the work of his Section, and for arranging the Sectional excursions in consultation with the Local Secretaries.

33. Sectional Committee shall meet on the opening day of each Session of the Congress, and daily thereafter during the Session before the meeting of the Session unless otherwise determined at a meeting of the Sectional Committee.

In the absence of the Sectional President from any of its meetings the most senior member of the Sectional Committee present shall take the chair.

In their meeting on the opening day they shall,

(*a*) elect a Sectional President and a Sectional Recorder for the ensuing year in accordance with the procedure laid down in Reg. 1(8);

(*b*) determine the detailed arrangements for the Sectional meetings;

(*c*) select the papers to be read and discussed;

and in their meetings during the Session they shall also,

(*d*) nominate a Sectional Correspondent and a Local Sectional Secretary for the ensuing year for the consideration of the Executive Committee;

(*e*) determine the contents of the Sectional records in the Proceedings in accordance with Rule 34(*e*);

(*f*) consider means of improving the scientific work of the Section, and make suggestions to the Executive Committee whenever considered necessary;

(*g*) select topics for discussions at the next Session of the Congress and make necessary arrangements (*i*) through the President of the Section concerned for discussions within a Section, and (*ii*) through the Sectional President who has initiated the proposal for a discussion in which more than one Section will participate.

34(*a*) All papers submitted for reading at the next Session for the Congress shall be forwarded to the General Secretary so as to reach him not later than September 15th of the calendar year preceding the Session of the Congress at which the papers are intended to be read, provided that this date may be changed by the Executive Committee for special reasons.

(*b*) Any paper submitted for reading at the Section of the Congress shall be accompanied by an abstract in triplicate.

(*c*) All papers submitted for reading at a Session of the Congress shall be checked by the Sectional Correspondent concerned or by such person or persons appointed by the General Secretary. The paper together with a copy each of the abstracts shall then be sent to the Sectional President concerned for refereeing and acceptance. Decisions with regard to acceptance or rejection of any paper shall be final and all reports confidential.

(*d*) No paper published elsewhere shall be accepted.

(*e*) Only abstracts of the paper received by the General Secretary before September 15th in accordance with Rule 34(*a*), (*b*) and (*c*) shall be printed in Part III of the Proceedings. In exceptional circumstances, abstracts of papers received after that date and read before the Section, if specially recommended by the Sectional Committee, may be printed in Part IV.

35. The Proceedings of the Indian Science Congress Association shall be published in one volume in four separate parts, as follows:—

I. To contain the list of officers, the Proceedings of the opening meeting (except the General President's Address) and all official matters.

II. To contain the Presidental Addresses. To be distributed to those present at the meeting after the addresses have been delivered, and to absent Ordinary, Honorary and Full Session Members by post after the meeting.

III. To contain the abstracts of papers to be read before the Sections which are received before September 15th in accordance with Rule 34(*a*). No abstracts shall be included in this volume from authors who have not enrolled themselves as Members of the Association. To be distributed in advance of the meeting to all Members of the Association.

IV. To contain the discussions, the abstracts accepted in accordance with Rule 34(*e*), the list of members and the index.

36. The following procedure shall be observed for the making of any addition to or alteration in the Rules of the Association:—

(*i*) Proposals for additions to and alternations in the existing Rules may be placed at any time before the General Committee by the Executive Committee.

(*ii*) (*a*) Proposals for additions to and alternations in the existing Rules by any Ordinary or Honorary Members of the Association shall be sent to one of the General Secretaries so as to reach him two full months before the meeting of the General Committee in which they are to be moved.

(*b*) One of the General Secretaries shall circulate such proposals to all Ordinary and Honorary Members of the Association at least one full month before the General Committee.

(*c*) Any amendments to the proposals shall be sent by any Ordinary or Honorary Member of the Association to one of the General Secretaries so as to reach him at least a fortnight before the meeting of the General Committee.

(*d*) The proposals together with any amendments shall be brought up before the meeting of the General Committee at the Annual Meeting during the Session of the Congress together with any remarks of the Executive Committee and declared carried if accepted by a two-thirds majority of the constitutent Members present and voting at the meeting.

(*Adopted* the 5th January, 1931. *Revised* the 15th January, 1935, the 6th January, 1936, the 5th January, 1937, the 8th January, 1939, the 6th January, 1940, the 5th January, 1942, the 4th January, 1943, the 5th January, 1945 and the 5th January 1948).

REGULATIONS

1. Sectional Officers

(1) The President delivers a Presidental Address of which ordinarily the cost of printing 16 pages of the Proceedings in its usual form shall be borne by the Indian Science Congress Association and any author exceeding the limit shall bear the extra cost, provided that in no case the Presidential Address shall exceed 25 pages. The time available for delivery of the Presidental Address shall usually not exceed 45 minutes. The manuscript of the address, ready for the press, should be received by the General Secretary before October 15th of the calendar year preceding the Session of the Congress at which the address will be delivered, provided that this date may be changed by the Executive Committee for special reasons. It should be accompanied by 12 copies of a short popular summary (about 500 words) for issue to the lay press. The time and date of the delivery of the President's Address will be communicated before the meeting of the Congress. No two Presidential Addresses will be delivered at the same time.

(2) The President shall be entitled to receive 30 copies of his address without charge, and additional copies at the cost of reproduction.

(3) Railway fares, postage, clerical or other expenses incurred by the Sectional Presidents will not be paid by the Association.

(4) The following procedure is adopted for the collection of papers for the Sections :—

About the middle of April a number of copies of a printed circular will forwarded to the President of each Section who may arrange to send these to workers in that branch of science with which his Section is concerned, requesting them to contribute papers for reading before the next meeting of the Congress.

The circular will contain a clause inviting such workers as are not yet Ordinary Members of the Association to join as such. Particular note should be taken of the fact that no new Ordinary Members are enrolled after the 15th July of the year.

In the case of joint papers, each author must be a Member of some category.

(5) The President referees, either in person or by proxy, the papers received for reading before his section in accordance with Rule 34.

Abstracts should be limited, except in very special cases, to about 200 words. Long abstracts should be reduced by the President. References to literature in abstracts should be avoided as far as possible and when given should conform to the system of abbreviation used by the Association.

The contents of all abstracts should be carefully checked by the Sectional Correspondent concerned or by such person or persons as appointed by the General Secretary and the abstracts shall then be sent to the Sectional President for his final scrutiny and approval.

Joint discussions on related papers may be held. Authors of papers should be informed of time allotted by the President to the reading of their papers. An author contributing more than one paper should be asked to specify which of them he would prefer to read at the meeting.

(6) The President, in consultation with the Local Sectional Secretary, shall make arrangements for such local Sectional excursions as seem desirable. Due notice shall be given to the General Secretaries of all such arrangements.

(7) The President and the Recorder should, in consultation with other members of the Sectional Committee, make proposals to the General Secretary regarding the programme of the Section. Such proposals should reach the General Secretary not later than the 1st November, so as to enable the necessary details to be entered in the programme. General discussions on questions of importance, held either by a single Section or jointly by two or more Sections, should be encouraged.

The Sectional Presidents concerned shall communicate to the General Secretary before the end of July the titles of such discussions, the names of the speakers and such further information as may be considered necessary.

The Papers, together with three copies of abstracts, to be read by the contributors at a discussion shall be sent to the General Secretary on or before th 15th September of the preceeding calendar year by the Sectional President concerned.

The materials relating to a discussion, in a form ready for the press, shall be communicated to the General Secretary within a month from the date on which the discussion takes place; the material not received by the General Secretary within this period shall not be published.

The President and the Recorder of the Section arranging a discussion shall carry out the necessary correspondence throughout the year during which they hold office.

(8) Early in November copies of a printed form will be issued to Presidents of Sections for circulation to members of the Sectional Committees requesting them to nominate a President and a Recorder for the ensuing meeting for consideration by the Sectional Committee. Such proposals shall be accompanied by a statement of qualifications of the nominees for the office and their willingness to accept the same if elected thereto.

During the first week of December, the President of each Section shall circulate all such proposals received by him, together with the statements of qualifications, to the members of the Sectional Committee and request them to nominate by ballot one member for each office from among the list circulated, the ballot papers being received by him up to the 20th December.

At the first meeting of the Sectional Committee held on the opening day, the ballot papers shall be opened and scrutinized as the Chairman shall direct and the result communicated to the Executive Committee for consideration, together with a complete record of the Proceedings in this connection.

(9) The duties of the Sectional Correspondent and of the Local Sectional Secretary are given in Rules 32 and 34(*c*).

(10) All persons entitled to be members of the Sectional Committee should enrol themselves without delay as Ordinary Members if not already so enrolled and should inform the General Secretary of the payment of their subscription when accepting the appointment.

(11) The General Secretary should be consulted whenever any question arises not dealt with in these regulations.

II. Local Arrangements

In accordance with the Rules of the Association, the Local Secretaries and the Local Committee shall jointly, on behalf of and in consultation with the Executive Committee, make all necessary arrangements for holding the Session of the Congress.

The following arrangements have to be made:—

A. Accomodation for the Scientific Meetings

(1) A large hall should be available for (*a*) the President's address on the opening day, and (*b*) for the evening lectures. Both (*a*) and (*b*) are open to the public free of charge. A projection lantern with an operator should be available in this room, and it is great advantage if loud speakers can be installed.

(2) Rooms for the meeting of the different Sections of the Congress should be provided and suitably furnished. An epidiascope with an operator should be provided in each sectional room. All the rooms should be as far as possible in close proximity. The following are the Sections of the Congress:—

Mathematics, Statistics, Physics, Chemistry, Geology and Geography, Botany, Zoology and Entomology, Anthropology and Archæology, Medical and Veterinary Sciences, Agricultural Sciences, Physiology, Psychology and Educational Sciences, and Engineering and Metallurgy.

(3) A Reception room should be provided in which members can get information, write letters, etc. The Local Secretaries' Office should be as near as possible to this room. An arrangement should be made with the Postmaster-General to have a temporary Post Office in this room for all letters addressed to members C|o. The Indian Science Congress to be delivered here. The Indian Science Congress Post Office should be situated as near as possible to the Reception room.

(4) A room near the Reception room should be set apart for the General Secretaries' Office, which will be opened therein from the 31st December.

(5) Provision should be made for lunch in European and Indian styles at moderate charges near the Reception room.

B. Accommodation for Visiting Members

The Local Secretaries should send out, not later than the end of November, a printed circular to all members enrolled, asking them if they desire that accommodation should be arranged for them. It is desirable, as far as possible, to provide private hospitality for the President, Sectional Presidents and Officers of the Congress. In this circular information should be given regarding the types of accomodation available, with the charges, and the nature of the climate during the Session. The Local Secretaries will receive periodically from the General Secretary list of members enrolled at headquarters.

C. Programme of the Meeting

(1) (*a*) The Sections of the Congress meet daily in the morning generally from 9-30 A.M.

(*b*) Presidential Addresses of the Sections shall commence from 9-30 A.M.

(*c*) There should be no afternoon Presidential Addresses of the Sections.

(*d*) Symposia or joint discussions will be held either in the morning or from 2 P.M.

(2) Public lectures are arranged by the Executive Committee, and are given at 6 P.M. or 6-30 P.M.

(3) A printed guide with a map of the locality in which the Congress is held should be prepared for distribution to members on the opening day. Only Ordinary, Honorary and Full Session Members are entitled to the Guide Book free of cost. A small charge not exceeding Re. 1|- (to be fixed by the Local Committee) may be made to other members desiring to have a copy. The Guide Book should contain a summary of information concerning the scientific and educational activities and a short history of the locality, in addition to general information likely to be of use to visitors.

(4) Arrangements should be made for giving due publicity to the activities of the Congress, both before and during the meeting.

(5) A list of members with their local addresses where known should be printed and distributed on the opening day. A supplementary list should be typed and posted in the Reception room and maintained up-to-date. The Local Secretaries shall arrange for this.

(6) A provisional programme of social engagements should be drawn up by the Local Secretaries and sent to the General Secretary by the 15th November. It is essential that this be sent in time, as it has to be printed and distributed with the abstracts by the first week of December.

The General Secretary will make arrangements for printing the programme drafted as above and distributing those to members enrolled at the time of the distribution of the abstracts.

The final programme shall be printed locally by Local Committee in time for the opening of the Session.

D. General

(1) Numbered badges for members of the Congress will be sent by the General Secretary to the Local Secretaries for distribution on the opening day of the meeting. The badges should bear numbers corresponding to the enrolment numbers. There should be additional badges for Officers.

(2) Members of the Local Reception Committee who have made substantial contributions to the funds of the Local Committee may be given complimentary tickets to attend the meetings.

(3) An audited copy of the accounts of the Local Committee should be sent to the General Secretary not later than the 30th April, following the Session, for inclusion in the Proceedings of the Session. It is desirable that the Local Committee should contribute any surplus to the reserve fund of the Association.

(4) Twelve copies each of all local publications connected with the Congress (Guide Book, final programme, notices, cards, etc.) should be sent to the office of the Association for record at the conclusion of the meeting.

(5) Applications for membership will ordinarily be dealt with by the General Secretary at the Office of the Association up to the 15th December. After that date applications for membership will be forwarded to the Local Secretaries, who will open a separate account for the sale of membership tickets. The amount thus realized, together with unsold tickets, should be forwarded to the General Secretary immediately after the close of the Congress.

III. Financial

(1) The accounts of the Association shall be audited once a year and the books closed on the 30th November each year for this purpose.

(2) The audited accounts shall be placed before the General Committee at the Annual Meeting with the observations, if any, of the Executive Committee.

(3) Sanction for all payments for amounts exceeding Rs. 100 shall be obtained from the Finance Committee which shall consist of the General Secretaries, the Treasurer and one Ordinary or Honorary Member resident in Calcutta who shall be nominated by the Executive Committee.

(4) Amounts received on account of Life Membership Subscription shall be credited to the Reserve Fund of the Association.

IV. Election of Representatives of Association by the Executive Committee

(1) A letter shall be issued asking for nominations giving a last date therefor.

(2) The proposer should ascertain whether the person he proposes is desirous of serving in that particular capacity.

(3) After the nominations have been received the names should be circulated in a ballot paper and the date for return should be fixed two weeks after the ballot paper is sent out.

V. Nomination of General President

(1) The General Secretary shall invite nominations for the office of General President of the Association, two years in advance, by a circular letter to the members of the Council, not later than the 15th of October. Such circular shall include a list of the General Presidents of the past 15 years, and the branches of science in which they had specialized.

Nominations shall reach the General Secretary not later than the 15th of November.

(2) The General Secretary shall circulate the nominations received to the members of the Executive Committee for expression of opinion on or before the 30th November. Such opinions shall reach the General Secretary not later than the 15th December.

(3) The nominations, together with the views of members thereon, shall be placed for decision before a meeting of the Executive Committee to be held on the day previous to the commencement of the Session of the Congress.

(*Adopted* the 5th January, 1937. *Received* the 8th January, 1939, the 6th January, 1940, the 6th January, 1941, the 5th January, 1942, the 4th January, 1943 and the 5th January, 1945).

STATEMENT OF ACCOUNT.

THE INDIAN SCIENCE

1, PARK STREET,

Balance

as at 30th

LIABILITIES:

			Rs.	As.	P.	Rs.	As. P
General Fund:							
As per last Account	..	..	8,733	12	11		
Add, this year being excess of Income over Expenditure	..	..	14,386	6	0		
*Excess of Income over expenditure (Foreign Scientists)	..	..	9,307	14	9		
		Rs.	32,428	1	8		
Less, transferred to Reserve Fund	..	..	708	0	0		
		Rs.	31,720	1	8		
Add excess expenditure on Foreign Scientists at 34th Session now recoverd	..	..	6,946	1	0	38,666	2 8
Reserve Fund:							
As per last account	..	..	20,320	15	4		
Adi, transferred from General Fund	..	..	708	0	0		
Interest earned	..	..	259	0	0		
			21,287	15	4		
Less, Bank charges	..	..		1	0	21,287	14 4
		Carried Over				59,954	1 0

CONGRESS ASSOCIATION

CALCUTTA.

Sheet

November, 1949.

ASSETS :

		Rs.	As.	P.	Rs.	As.	P
Furniture & Fittings:							
As per last Account		2,594	8	0			
Add this year		68	1	0			
	Rs.	2,662	9	0			
Less, Depreciation @ 5% on Rs. 2,594|8|- ..		129	11	0	2,532	14	0
Typewriter (as per last account)					650	0	0
Outstanding Account (as per last A|c) Burmah Shell					636	0	0
Advance (adjustable)					50	0	0
Reserve Fund Investment:							
4% Loan 1960-70 (Face value 5000|-)							
3% Victory Loan 1959-61 (Face value 2000|-)							
12 Years National Savings Certificate (5000|-) at cost		12,977	9	10			
Imperial Bank of India Reserve Fund A|c ..		8,310	4	6	21,287	14	4
Carried Over					25,156	12	4

THE INDIAN SCIENCE

1, PARK STREET,

Balance

as at 30th

						Brought forward		59,954	1 0
LIABILITIES:									
						Rs.	As P.	Rs.	As. P
Govan Brothers	..	..	..	..		289	6 0		
Indian Statistical Institute		..	..	..		416	0 6		
Great Eastern Hotel		..	..	..		34	0 0		
Printing	..	..	..	..		324	6 0		
Postage	..	..	..	..		399	2 6		
Establishment		..	..	..		730	0 0		
Contingency	..	..	..	..		47	13 3		
Telephone	..	..	..	..		46	2 3		
Rent ..	..	..	..	..		300	0 0		
Expenses at 36th Session		..	..	..		1,527	0 0	4,113	14 6
Suspense: Dr. M. S. Vallatra		..	..	..				1,149	0 0
*There was a deficit amounting to Rs. 9,921-10-3 as per last year's account which may now be recovered in part out of this surplus			..	..					
							Rs.	65,216	15 6

I have audited the Balance Sheet as at 30th November, 1949, and the annexed Income and Expenditure account also the Statement of expenditure on Foreign Scientists of the Indian Science Congress Association for the year ended 30th November 1949 with the books and vouchers of the Association and have obtained all the information and explanations I have required. In my opinion the Balance Sheet and Income and

CONGRESS ASSOCIATION

CALCUTTA.

Sheet (Contd.)

November, 1949.

	Brought forward		25,156 12 4
Cash-in-hand and at Bank:			
	Rs.	As. P.	
In hand	75	0 0	
Imperial Bank of India	*39,985	3 2	40,060 3 2

*A. This includes Rs. 9,307-14-9 to be refunded to Govt. of India on account of expenses of Foreign Scientists received in excess ..

B. Rs. 15,000|- being the grant for the year 1949-50 was received within this year .. ..

Rs. 65,216 15 6

Expenditure account are properly drawn up and the Balance Sheet exhibits the true and correct view of the Association's affairs as on that date according to the best of my information and explanations given to me and as shown by the books of the Association.

Sd|-. S. N. Chatterjee

20, Strand Road, Calcutta
21st December, 1949.

Chartered Accountant,
Auditor

THE INDIAN SCIENCE

1, PARK STREET,

Statement of Govt. Grant and

at 36th Session

				Rs.	As.	P.	Rs.	As. P
To Hotel Charges	..	..	..	4,593	0	6		
„ Air Fares in India	..	..	..	2,521	0	0		
„ Raliway Fares	..	..	..	368	12	0		
„ Air Fares to and from India		..	..	22,162	13	0		
„ Allowances ..	..	..	..	400	0	0		
„ Sundry Charges	..	..	..	483	1	3		
„ Taxi Hire	..	..	..	688	7	0		
			Rs.	31,217	8	0		
Less Provision made in last Year's A|c.			..	27,800	12	6	3,326	12 3
To Excess Air passage at 36th Session	..	..					5,619	4 0
„ Provision for expenses at 36th Session, pucca bills for which have not yet been received			..				1,527	0 0
„ Excess expenditure at 34th Session not provided for in last year's account now recovered, transferred to General Fund	..	..					6,946	1 0
„ Excess of Income over expenditure	..	..					9,307	14 9
			Rs.				26,727	0 0

CONGRESS ASSOCIATION

CALCUTTA.

Expenditure on Foreign Scientists at Allahabad, 1949.

	Rs.	As. P.	Rs.	As. P
By Government Grant			26,727	0 0
			Rs. 26,727	0 0

THE INDIAN SCIENCE

1, PARK STREET,

Income & expenditure

for the year ending

	Rs.	As.	P.
To Establishment	6,479	13	0
„ Postage	2,457	2	0
„ Contingency	738	9	0
„ Printing	15,622	9	0
„ Telephone	239	5	3
„ Binding Charges	317	15	0
„ Advertising	70	10	0
„ Travelling	1,045	6	9
„ Stationary	418	6	0
„ Rent	900	0	0
„ Depreciation on Furniture	129	11	0
„ Bank Charges	81	6	0
„ Excess of Income over Expenditure ..	14,386	6	0
Rs.	42,887	3	0

CONGRESS ASSOCIATION .

CALCUTTA.

Account

30th November 1949.

				Rs.	As.	P.	Rs.	As. P
By Membership Subscription ..	..	..	..	24,760	0	0		
„ Publication Sales ..	..	..	..	1,013	3	0		
„ Government of India Grant	..	..	..	15,000	0	0		
„ Miscellaneous ..	..	..	..	31	0	0		
„ Donation	..	..	..	51	0	0		
„ National Institute of Science	..	..	..	1,450	0	0		
„ Life Membership ..	..	..	..	582	0	0	42,887	3 0
							Rs. 42,887	3 0

THE INDIAN SCIENCE

1, PARK STREET,

Estimated Budget for Revenue Income and Expenditure

EXPENDITURE

	Estimated for 1948-49	Actuals for 1948-49	Estimated for 1949-50
1. Revenue Expenditure:	Rs. As P	Rs. As P	Rs. As P
		(1)	
Establishment (Staff salary including D A.)	13,350 0 0	6,470 13 0	14,000 0 0
		(2)	
Printing & Paper	31,000 0 0	15,622 0 0	20,000 0 0
Rent (including proposed Library). ..	2,100 0 0	000 0 0	2,100 0 0
Postage	2,000 0 0	2,457 2 0	2,050 0 0
Stationery & Stores	500 0 0	418 6 0	600 0 0
Telephone & Electricity	300 0 0	230 5 3	400 0 0
		(3)	
Travelling (including venue of the session and conveyances)	1,500 0 0	1,045 6 0	2,000 0 0
		(4)	
Travelling allowances to the members of the Executive Committee and Council to attend meeting	5,000 0 0	Nil.	5,000 0 0
Miscellaneous and Contingency including Railway Freight, to venue of the session, Bank charges, Depreciation ..	1,000 0 0	1,338 3 0	2,000 0 0
		(5)	
Audit fee	200 0 0	Nil.	200 0 0
Excess of Income over Expenditure ..		14,380 6 0	
Rs.	50,950 0 0	42,887 3 0	48,950 0 0

(Carried over)

CONGRESS ASSOCIATION

CALCUTTA.

for the year ending on 30th November, 1950.

INCOME

	Estimated for 1948-49	Actuals for 1948-49	Estimated for 1949-50
1. Revenue Income:			
	Rs. As P	Rs. As P	Rs. As P
Membership Subscription	25,000 0 0	24,760 0 0	26,000 0 0
Publication Sales	1,000 0 0	1,013 3 0	1,200 0 0
Government of India Grant	15,000 0 0	15,000 0 0	15,000 0 0
Grant From N. I. of Science	1,000 0 0	1,450 0 0	1,450 0 0
		(6)	
Miscellaneous, Donation, Life Membership		664 0 0	
Rs.	42,000 0 0	42,887 0 0	43,650 0 0

(Carried over)

THE INDIAN SCIENCE

1, PARK STREET,

Estimated Budget for Revenue Income and Expenditure

EXPENDITURE

	Estimated for 1948-49	Actuals for 1948-49	Estimated for 1949-50
	Rs. As P	Rs. As P	Rs. As P
Brought forward	56,950 0 0	42887 3 0	48,950 0 0
2. Capital Expenditure: Furniture and office equipments for Library room, Reserve Fund Investment with Imperial Bank of India ..	5,000 0 0	259 0 0	15,000 0 0
Rs.	61,950 0 0	43,146 3 0	63,950 0 0

CONGRESS ASSOCIATION

CALCUTTA.

for the year ending on 30th November, 1950.

INCOME

	Estimated for 1948-49	Actuals for 1948-49	Estimated for 1949-50
	Rs. As P	Rs. As P	Rs. As P
Brought forward	42,000 0 0	42887 0 0	43,650 0 0
2. Capital Income:			
			(7)
Interest on Reserve Fund Investment ..	475 0 0	259 0 0	500 0 0
Rs.	42,475 0 0	43,146 3 0	44,150 0 0
Deficit.	19,475 0 0		19,800 0 0
Rs.	61,950 0 0	43,146 3 0	63,950 0 0

1. Includes provision for a Secretary and Provident Fund contribution.

2. Large stock of paper was brought forward from 1947-48 and was consumed in 1948-49 and as such the actuals is low compared with 1949-50 estimate.

3. It is expected that in the 37th session travelling expenses may have to be paid to office bearers as the venue of the session is situated at a greater distance than before and further it has been proposed that in future the meetings of the Executive Committee may be held in Delhi and Calcutta by rotation.

4. Increased as the venue of the session is situated at a great distance from Calcutta than before.

5. Accounts were audited this year by a member of the Association.

6. Based on estimated investment.

7. No estimate has been made as the nature of receipts is casual.

PROCEEDINGS

OF THE PAST SESSIONS OF

INDIAN SCIENCE CONGRESS

PRICE LIST OF COMPLETE VOLUMES

				Rs.	as.	p.
1st	Session	1914,	Calcutta	0	12	0
2nd	„	1915,	Madras	1	8	0
3rd	„	1916,	Lucknow	2	10	0
4th	„	1917,	Bangalore	2	4	0
5th	„	1918,	Lahore	5	10	0
6th	„	1919,	Bombay	3	0	0
7th	„	1920,	Nagpur	3	12	0
8th	„	1921,	Calcutta	4	14	0
9th	„	1922,	Madras	5	4	0
10th	„	1923,	Lucknow	7	8	0
11th	„	1924,	Bangalore	6	12	0
12th	„	1925,	Benares	9	0	0
13th	„	1926,	Bombay	12	6	0
14th	„	1927,	Lahore	9	12	0
15th	„	1928,	Calcutta	12	12	0
16th	„	1929,	Madras	12	0	0
17th	„	1930,	Allahabad	15	0	0
18th	„	1931,	Nagpur	13	14	0
19th	„	1932,	Bangalore	18	12	0
20th	„	1933,	Patna	17	4	0
21st	„	1934,	Bombay	12	12	0
22nd	„	1935,	Calcutta	15	0	0
23rd	„	1936,	Indore	18	0	0
24th	„	1937,	Hyderabad	16	8	0
25th	„	1938,	Calcutta	30	0	0
26th	„	1939,	Lahore	20	0	0
27th	„	1940,	Madras	27	6	0
28th	„	1941,	Benares	30	4	0
29th	„	1942,	Baroda	25	8	0
30th	„	1943,	Calcutta	19	8	0
31st	„	1944,	Delhi	18	0	0
32nd	„	1945,	Nagpur	18	4	0
33rd	„	1946,	Bangalore	21	4	0
34th	„	1947,	Delhi	23	2	0
35th	„	1948,	Patna	23	0	0
36th	„	1949,	Allahabad	21	12	0

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